December 12, 2025

Mr. Chris Scholl
Commonwealth Fusion Systems
117 Hospital Road
Devens, MA 01431

Email: cscholl@cfs.energy

SUBJECT: Environmental Sound Study DRAFT 2
Commonwealth Fusion Systems – Full Campus

Dear Mr. Scholl,

Cavanaugh Tocci has conducted a study of environmental sound produced by mechanical equipment associated with a full build-out of the Commonwealth Fusion Systems (CFS) campus in Devens, MA. This study reviews applicable limits on facility sound and develops sound control concepts as may be required for compliance with the industrial performance standards (IPS) noise regulations of the Devens Enterprise Commission (DEC). Appendix A presents a glossary of acoustical terminology used in this report. Appendix B presents equipment sound data used in sound modeling.

The CFS campus is located at 117 Hospital Road in Devens, MA. Construction of CFS-1 is substantially complete and the building is occupied, CFS-2 is under construction with portions in use, and CFS-3 and CFS-4 are in the design phase. Construction of CFS-4 is anticipated to begin in Spring 2026, and construction of CFS-3 should begin about one year later. Figure 1 shows the location of CFS facilities in relation to the CFS campus and surrounding area.

The DEC requires that sound produced by all four buildings operating together under full-capacity, frequently occurring conditions comply with the IPS limits.

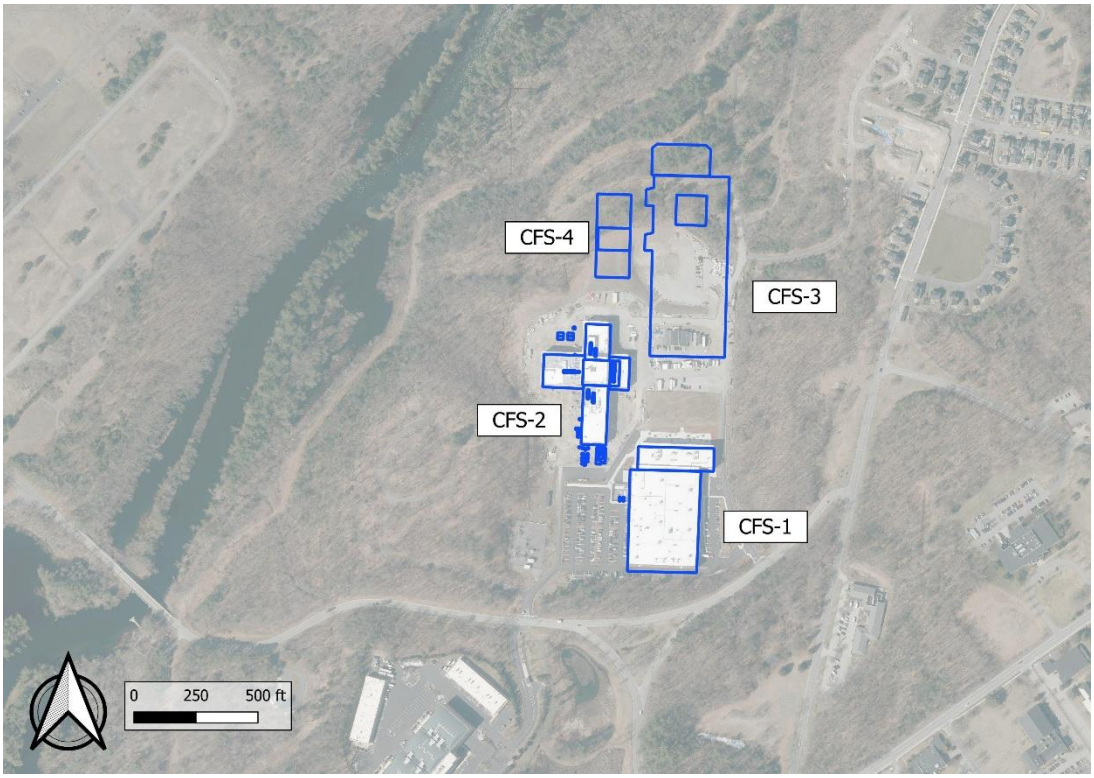


Figure 1. Aerial image showing locations of campus buildings
Commonwealth Fusion Systems, Devens, MA

Figure 2 is an excerpt from the Devens Reuse Plan. The figure shows the location of the CFS campus. The campus is located within the boundaries of the DREZ (Devens Regional Enterprise Zone) and is surrounded by the Innovation & Technology Business zone within the DREZ. The nearest residential zoned properties within the DREZ are located approximately 300 feet northeast of the campus. Nearest residential properties outside the DREZ are located approximately 1,800 feet northwest in Shirley, MA.

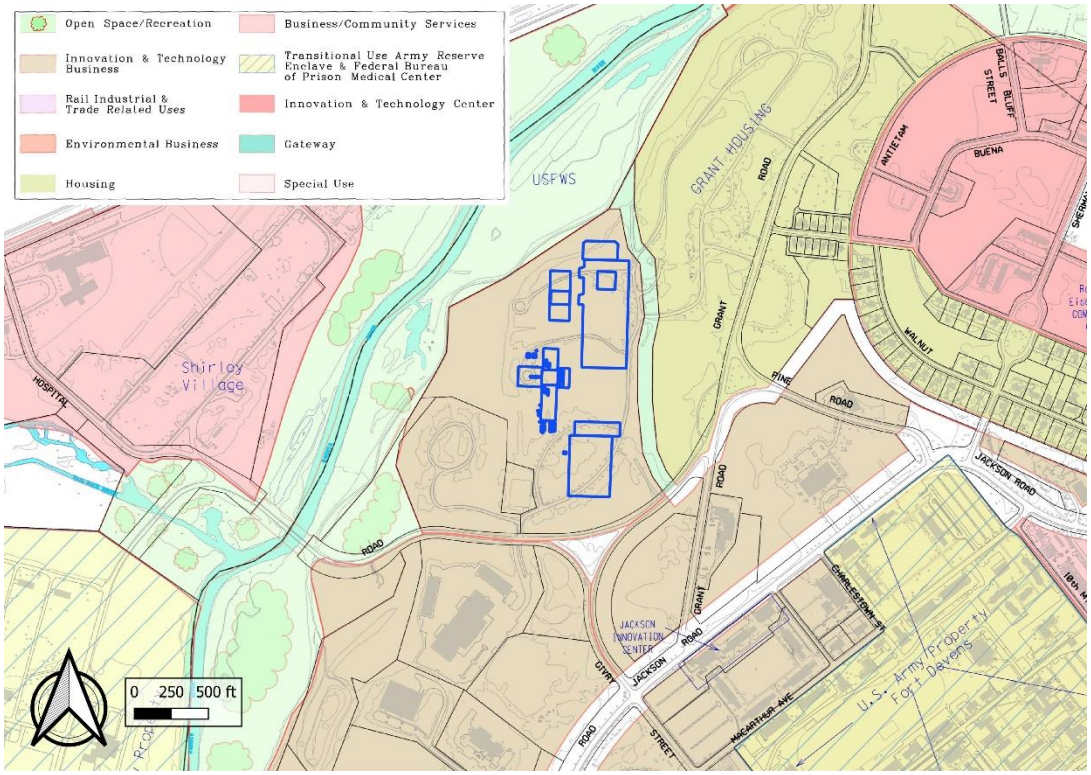


Figure 2. Devens zoning map showing campus location
Commonwealth Fusion Systems, Devens, MA

Environmental Noise Regulations

Noise is a feature of all environments and is considered objectionable only when it is inconsistent with its environment by being either too loud or by being distinctive in character (i.e., tonally or temporally varying). The purpose of environmental noise regulations is to provide a logical and equitable relationship between facility noise and existing environmental sound. The regulations applicable to noise caused by Campus equipment are summarized below.

Devens Industrial Performance Standards

Sound produced within the DREZ is subject to regulation by the Devens Enterprise Commission (DEC) under 974 CMR 4.00 Industrial Performance Standards (Devens noise policy). Specifically, Section 4.05 Noise and Vibration, establishes sound limits intended to "*…preclude or significantly mitigate conditions that could cause nuisance to any receptor within or without Devens*."

Subsection 3 states the following:

> (3) Noise Limits and Standards - Internal and External Impacts. No party owning, leasing, controlling, or otherwise occupying a facility within Devens shall be allowed to cause

pronounced, multiple patterns of noise or vibration nuisance to or interference with any receptor.

No party owning, leasing, or otherwise controlling a facility within Devens shall be allowed to:

(a) Produce a broadband sound pressure level which exceeds an existing background sound pressure level by the following margins:

1. 5 dBA as measured at any residential property line or receptor within Devens.
2. 10 dBA as measured at any commercial or industrial property line or receptor within Devens.
3. 5 dBA as measured at any Devens perimeter boundary abutting a residential External Receptor,
4. 10 dBA as measured at any Devens perimeter boundary abutting a commercial or industrial External Receptor.

(b) Produce a broadband sound pressure level which exceeds the following levels:

1. 45 dBA nighttime/55 dBA daytime, as measured at any residential property line or receptor within Devens.
2. 60 dBA as measured at a commercial or industrial property line or receptor within Devens.
3. 45 dBA nighttime/55 dBA daytime as measured at any Devens perimeter boundary abutting a residential External Receptor
4. 60 dBA as measured at any Devens perimeter boundary abutting a commercial or industrial External Receptor.

(c) Produce a "pure tone" condition. (definition to follow)

(d) Produce "impulsive" noise in excess of decibel limits and durations established herein (definition to follow)

"*Background sound pressure level*" is defined as the A-weighted sound pressure level that exceeded 90% of the quietest one-hour time interval during equipment operating hours. [Ref. subsection 3(d)(1)]

"*Daytime hours*" are 7:00 am to 6:00 pm weekdays. Nighttime hours are all other times, including legal holidays. [Ref. subsection 3(d)(3)]

A "*pure tone*" is sound concentrated in a narrow frequency range, and is perceived as a humming, buzzing, whirring, or other such distinctive continuous sound. A pure-tone condition is defined to exist when the sound pressure level in a one-third octave band exceeds the sound pressure levels in both adjacent one-third octave bands, and if the average amount exceeded in both adjacent bands is greater than values provided in subsection 3(d)(7).

"*Impulsive*" noises are sounds which occur intermittently rather than continuously. Impulsive noise may exceed existing background sound levels for a cumulative duration of not more than one minute within any given one-hour period, and subject to the following limits: may exceed the background by up to 10 dBA as measured at any residential property line or receptor, or 15 dBA as measured by any commercial/industrial property line or receptor. The impulsive limit applies only to daytime hours at residential receptors, day and night at commercial and industrial receptors. Readings for impulsive noise shall be recorded with fast sound level meter response. [Ref. subsection 3(d)(8)]

Prior Campus Sound Analysis

Cavanaugh Tocci performed baseline sound monitoring in August 2022 to determine background sound levels and resulting IPS variable sound level limits. This work was documented in a memo "CFS August 2022 Sound Monitoring" dated December 8, 2022.

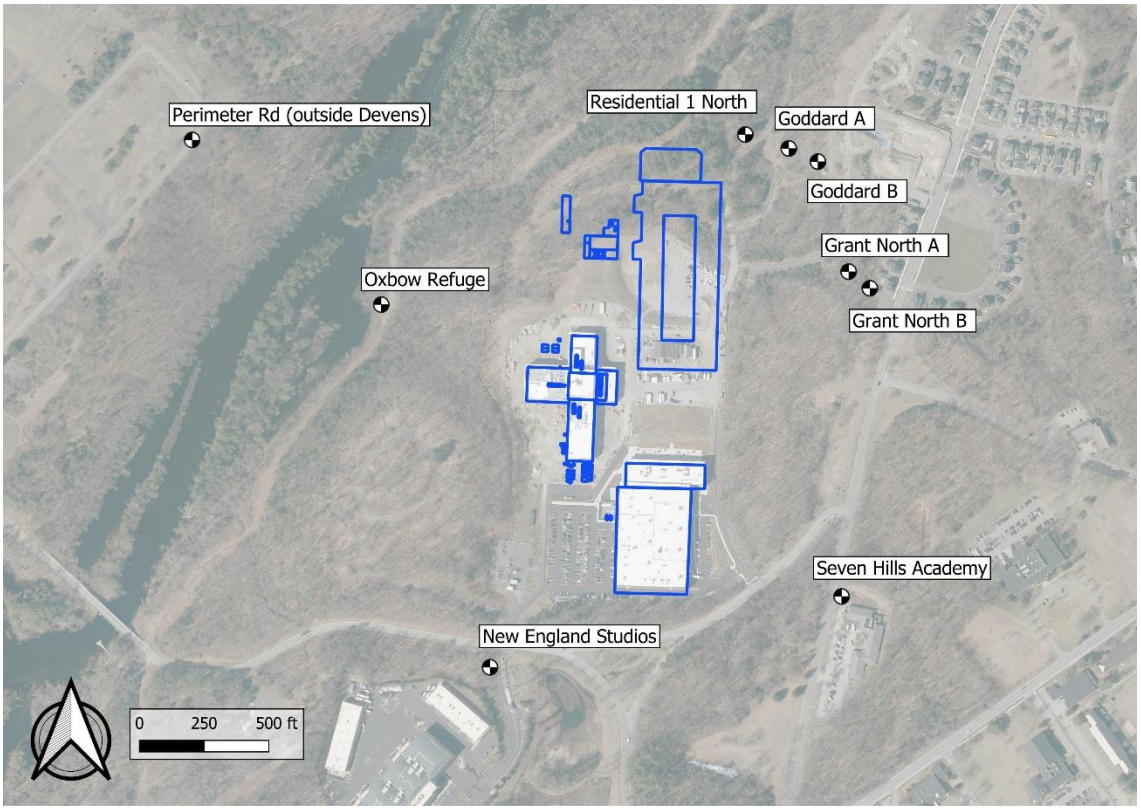


Figure 3. Modeled receptor locations
Commonwealth Fusion Systems, Devens, MA

Facility Sound Impact Assessment

Campus mechanical equipment sound transmitted to receptor study locations has been estimated using Cadna/A (Datakustik GmbH, Version 2025 MR1), a sound propagation loss computer model. Cadna/A implements the sound propagation loss algorithms of ISO 9613-1 and ISO 9613-2 to estimate source sound levels at community receptor locations. In calculating sound levels at receptor locations, the Cadna model accounts for reductions in facility sound pressure levels associated with propagation distance, shielding by intervening structures and topography, and absorption of sound by the atmosphere and porous surfaces.

We have assumed that buildings are acoustically reflective (sound reduction of 1 dB). Shielding from topography and existing buildings was included in this analysis. To account for multiple reflectors, two orders of reflection have been included in computer modeling, as is typical for this type of analysis.

Civil survey and grading plans were used for topography of the site and immediate environs. United States Geological Survey (USGS) topography was used for the remainder of the model.

A ground absorption of G=0 has been used for paved surfaces on the CFS campus and the New England Studios facility to the southwest. A ground absorption of G=0.5 has been used for the remainder of the modeled area.

Sound levels were calculated for the receptor sites shown in Figure 3. First- and second-floor receptors were used for residential receptors. First-floor receptors are modeled at 7 feet above grade, and second-floor receptors at 15 feet above grade.

CFS-1 Sound Sources and Assumptions

The following are the CFS-1 sources included in our analysis. All sources were modeled at full capacity operation, unless indicated otherwise. The noise data for these sources have been obtained from manufacturer specifications, attached in Appendix B of this report.

- Two chiller units (CH).
- Seventeen exhaust fans (EF) for ventilation and process exhaust.
- Eight supply fans (SF) for ventilation.
- One kitchen exhaust fan (KEF) and one kitchen make-up air unit (KMAU).
- Nine office cooling units (CU).
- Two office energy recovery ventilation (ERV) units.
- One rooftop unit (RTU).
- Four transformers.
- One packaged rooftop unit and one exhaust fan for the FLiBe South Lab have been recently added to CFS-1 and are included in this analysis.

The chillers are modeled at 75% load at all times.

The following equipment is inactive at night:

- All KEF, KMAU, CU, ERU.
- SF-6, SF-7, SF-8.
- EF-6, EF-7, EF-9, EF-11, EF-17.

The following fans operate at 75% speed at night:

- SF-1 through SF-4.
- EF-1 through EF-4.

Facility systems personnel have confirmed that these restrictions have been implemented.

Sound barriers around the following items have been included in the model. Inner barrier surfaces are modeled with absorption of NRC= 0.95. To date, not all of these barriers have been implemented, and further analysis may determine that some are not necessary.

- ERU-1 and ERU-2: height 3 meters.
- CU-1 through CU-4 and CU-6 through CU-8: 2.4 m.
- SF-1 through SF-4, SF-6, SF-8: 2.4 m.
- EF-1 through EF-4, EF-6, EF-11, EF-16, EF-18, EF-23, EF-24: 2.4 m.
- SF-5 and SF-7: 1.8 m.
- CH-1, CH-2, transformers: 2.4 m.

CFS-2 Sound Sources and Assumptions

The following are the CFS-2 sources included in our analysis. All sources were modeled at full capacity operation, unless indicated otherwise. The noise data for these sources have been obtained from manufacturer specifications, attached in Appendix B of this report.

- Two cooling towers (CT).
- Seven air handling units (AHU).
- Eleven fans.
- One blowdown compressor.
- Four transformers.
- One ground pump for liquid nitrogen delivery, and one ground pump vent.

The following operating restrictions are used in modeling. These restrictions are considered achievable by facility operators:

- Cooling towers are limited to 87% fan speed during the day, and 75% fan speed at night.
- Air handling unit AHU-3 is limited to 87% fan speed at night.
- Liquid nitrogen ground pump and ground pump vent do not operate at night.

Sound barriers around the following items have been implemented and are included in the model.

- AHU-1 and AHU-5: height 4 meters.
- AHU-6 and AHU-7: 4 m.
- AHU-2 and AHU-3: 3.3 m.

Duct silencers are modeled at the fresh air intakes of Fan-0005A/B, AHU-1, AHU-3, and AHU-4.

CFS-3 Sound Sources and Assumptions

The following are the CFS-3 sources included in our analysis. All sources were modeled at full capacity operation. The noise data for these sources have been obtained from manufacturer specifications, attached in Appendix B of this report.

- Thirty-two exhaust fans (EF) for ventilation and process exhaust.
- Eleven makeup air units (MAU).
- Two energy recovery ventilation (ERV) units.
- Three air-source heat pump units (ASHP, each unit comprises 8 cells).

A plan of the facility indicating modeled sound sources is presented in Figure 4. The following strategies have been proposed to limit sound impacts:

- Construct a penthouse to enclose most building mechanical equipment.
- Place intake and exhaust louvers on the west and south sides of the penthouse to reduce exposure of residences to the north and east.
- Apply sound attenuators and/or duct lining to the ductwork between mechanical equipment and louvers. In most cases, five feet of 2-inch acoustically lined duct will be sufficient, but exact recommendations will be based on final selections and ducting plans.
- Place air-source heat pumps at grade on the west side of the building.

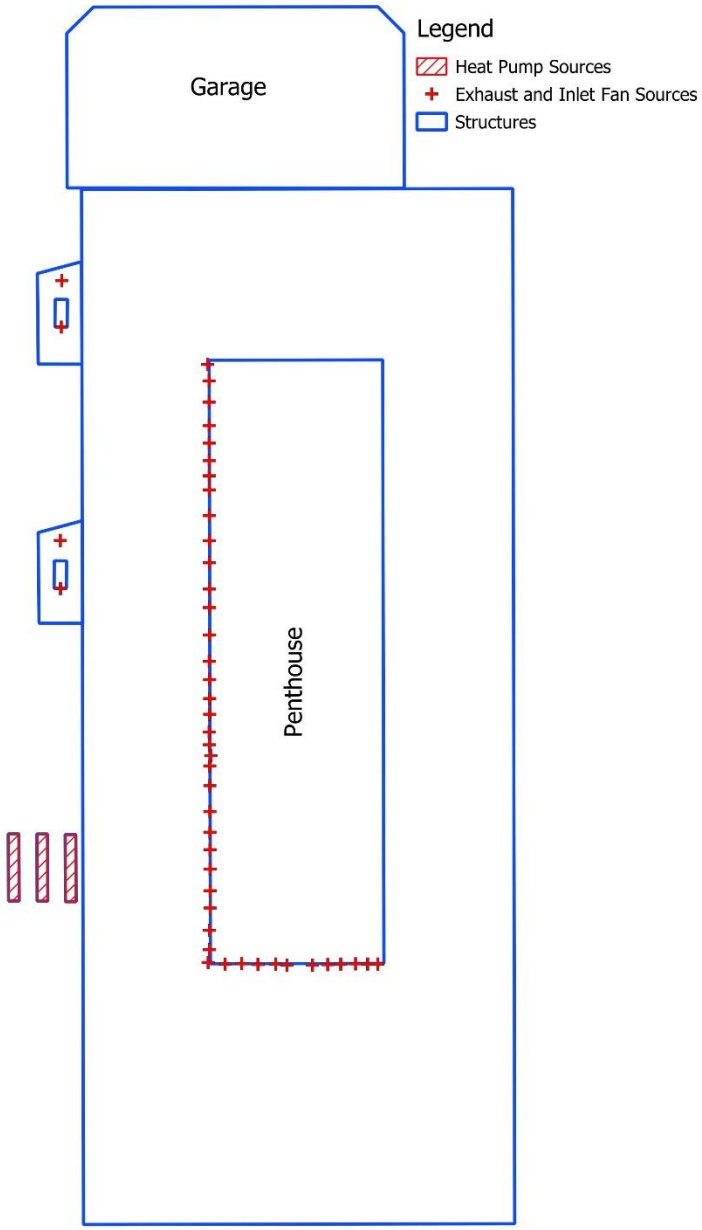


Figure 4. CFS-3 plan with sound sources
CFS Campus, Commonwealth Fusion Systems, Devens, MA

CFS-4 Sound Sources and Assumptions

The following are the CFS-4 sources included in our analysis. The noise data for these sources have been obtained from submittals attached in Appendix B of this report. A plan and elevation of the facility identifying modeled sound sources is presented in Figure 5.

- Process equipment:
    - Burner exhaust stack.
    - Three burners and auxiliary equipment.
    - Two heat exchange fluid coolers, with three fans each. Ultra low-noise fans are specified, and an acoustic barrier will extend 10 feet above and below the units on the west, north, and east sides.
- Building HVAC equipment:
    - Three air handling units (AHU) with integral sound attenuator at the outside air inlet.
    - Three exhaust air handling units (EAHU) with integral sound attenuator at the exhaust air outlet.
    - One air-cooled chiller (ACC) with attenuation package for minimum 10 dB reduction.
    - Two rooftop units (RTU).

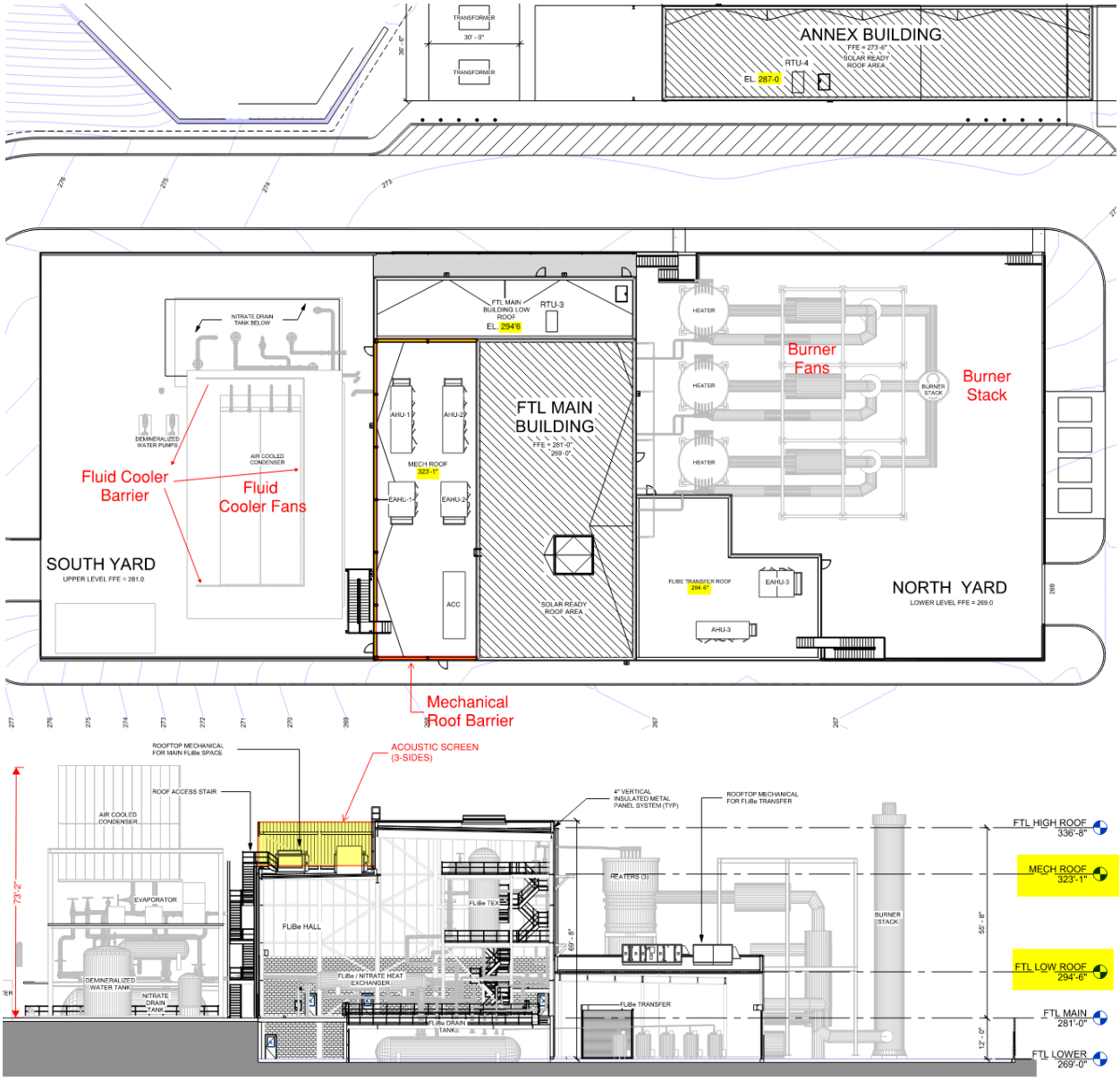


Figure 5a. CFS-4 plan and elevation
CFS Campus, Commonwealth Fusion Systems, Devens, MA

Modeling Results

Tables 2a, 2b, and 2c present estimated sound levels at modeled receptors. The first two tables present results for individual buildings, while the third presents results for the full campus. Results are compared to the applicable IPS variable and fixed sound level limits. Variable limits were established using measured background levels from baseline sound monitoring conducted previously (see the Vibrasure report referenced above). Results show no exceedances of IPS limits.

Receptor	Type	CFS-1 D/E/N	CFS-2 D/E/N	IPS Limits	
				Variable D/E/N	Fixed D/N
Residential 1 North (1st story)	Residential	24 / 24 / 21	22 / 22 / 20	**36 / 36 / 33**	**55/45**
Residential 1 North (2nd story)	Residential	25 / 25 / 22	23 / 23 / 21	**36 / 36 / 33**	**55/45**
Goddard A (1st story)	Residential	28 / 28 / 25	24 / 24 / 23	**36 / 36 / 33**	**55/45**
Goddard A (2nd story)	Residential	28 / 28 / 25	25 / 25 / 24	**36 / 36 / 33**	**55/45**
Goddard B (1st story)	Residential	30 / 30 / 26	30 / 30 / 28	**36 / 36 / 33**	**55/45**
Goddard B (2nd story)	Residential	30 / 30 / 27	31 / 31 / 29	**36 / 36 / 33**	**55/45**
Grant North A (1st story)	Residential	33 / 33 / 28	31 / 31 / 30	**36 / 36 / 33**	**55/45**
Grant North A (2nd story)	Residential	34 / 34 / 29	32 / 32 / 31	**36 / 36 / 33**	**55/45**
Grant North B (1st story)	Residential	30 / 30 / 25	31 / 31 / 29	**36 / 36 / 33**	**55/45**
Grant North B (2nd story)	Residential	32 / 32 / 26	33 / 33 / 31	**36 / 36 / 33**	**55/45**
New England Studios	Commercial	38 / 38 / 36	40 / 40 / 36	**48 / 47 / 47**	**60**
Oxbow Refuge	Commercial	22 / 22 / 18	37 / 37 / 34	**40 / 42 / 38**	**60**
Perimeter Rd (outside Devens)	Commercial	27 / 27 / 24	37 / 37 / 34	**40 / 42 / 38**	**60**
Seven Hills Academy	Res (D), Comm (E/N)	39 / 39 / 35	31 / 31 / 30	**41 / 44 / 41**	**55/60**

Table 2a. Estimated CFS-1 and CFS-2 equipment day/evening/night sound levels (dBA) at modeled receptors CFS Campus, Commonwealth Fusion Systems, Devens, MA

Receptor	Type	CFS-3 D/E/N	CFS-4 D/E/N	IPS Limits	
				Variable D/E/N	Fixed D/N
Residential 1 North (1st story)	Residential	16 / 16 / 16	15 / 15 / 15	**36 / 36 / 33**	**55/45**
Residential 1 North (2nd story)	Residential	16 / 16 / 16	16 / 16 / 16	**36 / 36 / 33**	**55/45**
Goddard A (1st story)	Residential	15 / 15 / 15	15 / 15 / 15	**36 / 36 / 33**	**55/45**
Goddard A (2nd story)	Residential	16 / 16 / 16	16 / 16 / 16	**36 / 36 / 33**	**55/45**
Goddard B (1st story)	Residential	16 / 16 / 16	18 / 18 / 18	**36 / 36 / 33**	**55/45**
Goddard B (2nd story)	Residential	17 / 17 / 17	19 / 19 / 19	**36 / 36 / 33**	**55/45**
Grant North A (1st story)	Residential	17 / 17 / 17	19 / 19 / 19	**36 / 36 / 33**	**55/45**
Grant North A (2nd story)	Residential	17 / 17 / 17	19 / 19 / 19	**36 / 36 / 33**	**55/45**
Grant North B (1st story)	Residential	16 / 16 / 16	19 / 19 / 19	**36 / 36 / 33**	**55/45**
Grant North B (2nd story)	Residential	17 / 17 / 17	21 / 21 / 21	**36 / 36 / 33**	**55/45**
New England Studios	Commercial	23 / 23 / 23	20 / 20 / 20	**48 / 47 / 47**	**60**
Oxbow Refuge	Commercial	27 / 27 / 27	25 / 25 / 25	**40 / 42 / 38**	**60**
Perimeter Rd (outside Devens)	Commercial	26 / 26 / 26	21 / 21 / 21	**40 / 42 / 38**	**60**
Seven Hills Academy	Res (D), Comm (E/N)	23 / 23 / 23	20 / 20 / 20	**41 / 44 / 41**	**55/60**

Table 2b. Estimated CFS-3 and CFS-4 equipment day/evening/night sound levels (dBA) at modeled receptors CFS Campus, Commonwealth Fusion Systems, Devens, MA

Receptor	Type	CFS Campus D/E/N	IPS Limits	
			Variable D/E/N	Fixed D/N
Residential 1 North (1st story)	Residential	27 / 27 / 25	**36 / 36 / 33**	**55/45**
Residential 1 North (2nd story)	Residential	28 / 28 / 26	**36 / 36 / 33**	**55/45**
Goddard A (1st story)	Residential	30 / 30 / 27	**36 / 36 / 33**	**55/45**
Goddard A (2nd story)	Residential	30 / 30 / 28	**36 / 36 / 33**	**55/45**
Goddard B (1st story)	Residential	33 / 33 / 31	**36 / 36 / 33**	**55/45**
Goddard B (2nd story)	Residential	34 / 34 / 32	**36 / 36 / 33**	**55/45**
Grant North A (1st story)	Residential	35 / 35 / 33	**36 / 36 / 33**	**55/45**
Grant North A (2nd story)	Residential	36 / 36 / 33	**36 / 36 / 33**	**55/45**
Grant North B (1st story)	Residential	34 / 34 / 31	**36 / 36 / 33**	**55/45**
Grant North B (2nd story)	Residential	35 / 35 / 33	**36 / 36 / 33**	**55/45**
New England Studios	Commercial	42 / 42 / 39	**48 / 47 / 47**	**60**
Oxbow Refuge	Commercial	38 / 38 / 36	**40 / 42 / 38**	**60**
Perimeter Rd (outside Devens)	Commercial	38 / 38 / 35	**40 / 42 / 38**	**60**
Seven Hills Academy	Res (D), Comm (E/N)	40 / 40 / 37	**41 / 44 / 41**	**55/60**

Table 2c. Estimated CFS full-campus equipment day/evening/night sound levels (dBA) at modeled receptors CFS Campus, Commonwealth Fusion Systems, Devens, MA

Tables 3a and 3b present day/evening and nighttime octave-band results for the full campus build-out. No pure-tone condition exists, as defined in the regulation.

Receptor	Overall Sound Level (dBA)	Octave-band sound levels (dB)							
		63	125	250	500	1000	2000	4000	8000
Residential 1 North (1st story)	27	39	35	30	24	18	13	5	-
Residential 1 North (2nd story)	28	40	36	31	25	19	14	6	-
Goddard A (1st story)	30	41	38	33	27	23	18	8	-
Goddard A (2nd story)	30	41	38	33	27	23	18	8	-
Goddard B (1st story)	33	43	41	37	31	26	21	10	-
Goddard B (2nd story)	34	43	42	37	32	27	22	12	-
Grant North A (1st story)	35	44	41	38	34	29	25	15	-
Grant North A (2nd story)	36	44	41	39	34	30	26	16	-
Grant North B (1st story)	34	43	40	37	32	26	21	11	-
Grant North B (2nd story)	35	44	41	38	34	28	24	15	-
New England Studios	42	48	46	43	40	37	32	24	-
Oxbow Refuge	38	49	46	41	35	31	24	16	-
Perimeter Rd (outside Devens)	38	47	44	40	36	32	25	16	-
Seven Hills Academy	40	45	44	41	38	34	31	23	-

Table 3a. Estimated CFS full-campus equipment day/evening octave-band sound levels at modeled receptors CFS Campus, Commonwealth Fusion Systems, Devens, MA

Receptor	Overall Sound Level (dBA)	Octave-band sound levels (dB)							
		63	125	250	500	1000	2000	4000	8000
Residential 1 North (1st story)	25	37	33	28	22	16	11	5	-
Residential 1 North (2nd story)	26	38	34	29	23	17	12	5	-
Goddard A (1st story)	27	39	35	31	25	20	15	5	-
Goddard A (2nd story)	28	39	36	31	25	20	15	6	-
Goddard B (1st story)	31	41	39	35	28	23	18	8	-
Goddard B (2nd story)	32	41	39	35	29	25	19	9	-
Grant North A (1st story)	33	41	38	36	31	25	21	11	-
Grant North A (2nd story)	33	42	38	37	32	27	22	12	-
Grant North B (1st story)	31	41	37	35	29	23	17	7	-
Grant North B (2nd story)	33	42	38	36	31	25	20	10	-
New England Studios	39	45	43	41	37	34	29	20	-
Oxbow Refuge	36	47	44	39	33	28	22	14	-
Perimeter Rd (outside Devens)	35	44	42	38	34	29	23	14	-
Seven Hills Academy	37	43	41	39	35	31	27	20	-

Table 3b. Estimated CFS full-campus equipment nighttime octave-band sound levels at modeled receptors CFS Campus, Commonwealth Fusion Systems, Devens, MA

Conclusion

Cavanaugh Tocci has evaluated environmental sound produced by mechanical equipment proposed for the Commonwealth Fusion Systems Campus in Devens, MA. We have presented modeled results for the full campus build-out. Estimated sound levels comply with IPS fixed and variable sound level limits.

Sincerely,
CAVANAUGH TOCCI

Bradley M. Dunkin, *Associate Principal Consultant*
25091/CFS campus acoustic analysis 2025-12-11.docx

SOUND MEASUREMENT TERMINOLOGY

In order to quantify the amplitude, frequency, and temporal characteristics of sound, various acoustical descriptors are used. The following is an introduction to acoustic terminology that is used in this report.

Sound Level

Sound levels are typically quantified using a logarithmic decibel (dB) scale. The use of a logarithmic scale helps to compress the wide range of human sensitivity to sound amplitude into a scale that ranges from approximately 0 to 180 dB. Note however, that the use of the logarithmic scale prevents simple arithmetic operations when combining the cumulative impact of sources. For example, two sources of equal sound level operated simultaneously results in a combined sound level that is only 3 dB higher than if only one source was operated alone. An important feature of the human perception of continuous sound is that an increase or decrease in sound pressure level by 3 dB or less is barely perceptible, and an increase or decrease by 10 dB is perceived as a doubling or halving of noise level.

A-weighting

Generally, the sensitivity of human hearing is restricted to the frequency range of 20 Hz to 20,000 Hz. However, the human ear is most sensitive to sound in the 500 Hz to 5,000 Hz frequency range. Above and below this range, the ear becomes progressively less sensitive. To account for this feature of human hearing, sound level meters incorporate filtering of acoustic signals that corresponds to the varying sensitivity of the human ear to sound at different frequencies. This filtering is called A-weighting. Sound level measurements that are obtained using this filtering are referred to as A-weighted sound levels and are signified by the identifier, dBA. A-weighted sound levels are widely used for evaluating human exposure to environmental sounds. To help place A-weighted sound levels in perspective, Figure A-1 contains a scale showing typical sound levels for common interior and environmental sound sources.

Spectral Characteristics – Octave and 1/3 Octave Band Sound Levels

To characterize a sound, it is often necessary to evaluate the frequency distribution of the sound energy. As mentioned before, the frequencies of most interest where human exposure is concerned range between 20 Hz and 20,000 Hz. This frequency range is commonly divided into octave bands, where an octave band is a range of frequencies. Each octave band is referred to by its center frequency and has a bandwidth of one octave (a doubling of frequency). To cover the full range of human hearing, it is necessary to measure sound in 10 separate octave bands. Typically, the lowest frequency band measured has a center frequency of 31.5 Hz. The next frequency band has a center frequency of 63 Hz. This geometric series continues to the highest frequency band that has a center frequency of 16,000 Hz. A set of octave band sound levels to describe a particular sound is called an octave band spectrum. Covering the full range of

hearing, an octave band spectrum would have 10 values, one for each band. Under certain circumstances, more frequency resolution in acoustical data is needed to identify the presence of tonal sounds. A 1/3 octave band spectrum uses filters that divide each octave band into 3 separate frequency bands. Note that octave band and 1/3 octave band sound levels are not usually A-weighted, with their units being dB.

Environmental Noise Descriptors

Sound levels in the environment are continuously fluctuating and it is difficult to quantify these time-varying levels with single number descriptors. Statistical approaches, which use *percentile sound levels* and *equivalent sound levels*, are often used to quantify the temporal characteristics of environmental sound.

Percentile sound levels (L_n) are the A-weighted sound levels that are exceeded for specific percentages of time within a noise measurement interval. For example, if a measurement interval is one hour long, the 50th percentile sound level (L_{50}) is the A-weighted sound level that is exceeded for 30 minutes of that interval.

- L_{90} is the sound level in dBA exceeded 90 percent of the time during the measurement period. The 90th percentile sound level represents the nominally lowest level reached during the monitoring interval and is typically influenced by sound of relatively low level, but nearly constant duration, such as distant traffic or continuously operating industrial equipment. The L_{90} is often used in standards to quantify the existing background or residual sound level.

- L_{50} is the median sound level: the sound level in dBA exceeded 50 percent of the time during the measurement period.

- L_{10} is the sound level exceeded only 10 percent of the time. It is close to the maximum level observed during the measurement period. The L_{10} is sometimes called the intrusive sound level because it is caused by occasional louder noises like those from passing motor vehicles or aircraft.

By using percentile sound levels, it is possible to characterize the sound environment in terms of the steady-state background sound (L_{90}) and occasional transient sound (L_{10}).

The equivalent sound level (L_{eq}) is the energy average of the A weighted sound level for the measurement interval. Sounds of low level and long duration, as well as sounds of high level and short duration influence this sound level descriptor.

Noise levels at night generally produce greater annoyance than do the same levels which occur during the day. It is generally agreed that a given level of environmental noise during the day would appear to be 10 dBA louder at night – at least in terms of potential for causing community concern. The day night average sound level (Ldn) is a 24-hour average A-weighted

sound level where a 10 dB "penalty" is applied to sound occurring between the hours of 10:00 p.m. and 7:00 a.m. The 10 dB penalty accounts for the heightened sensitivity of a community to noise occurring at night.

When a steady continuous sound is measured, the L_{10}, L_{50}, L_{90} and L_{eq} are all equal. For a constant sound level, such as from a power plant operating continuously for a 24-hour period, the L_{dn} is approximately 6 dBA higher than the directly measured sound level.

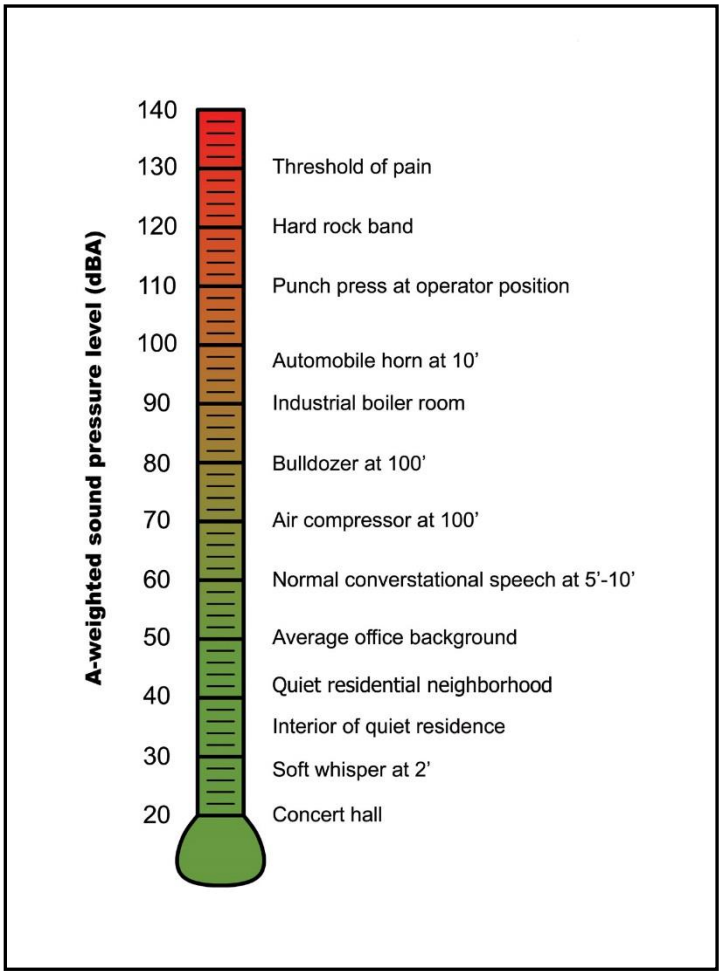


Figure A-1
Typical Sound Levels for Common Interior and Environmental Source

APPENDIX B

Computer Modeling Source Inputs
and Parameters

Equipment Sound Data

Images of sound power data from equipment submittals are presented below.

CFS-1 CH-1, CH-2

Tag Data - ACRB (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	165T 920rpm	1	Ascend Model ACR Screw Chiller (ACRB)	ACRB1655EUA*EUUCXNC2XCNLBREV1HBCBXXAA1XXXX0X

Product Data - ACRB

Item: A1 Qty: 1 Tag(s): 165T 920rpm

Air-Cooled Screw Chiller
Unit Startup By Trane
165 Nominal Tons
Screw w/ Variable Volume Ratio (GP4Vvi)
460 volt/60Hz/3 phase
Pueblo
Invisisound Ultimate
UL Listed-US/Canadian Safety Standard
ASME Pressure Vessel Code
Refrigerant Charge R-134A
AHRI Certified
ASHRAE 90.1 - 2016
Standard Cooling
Chil 2-pass
Propylene Glycol
Grooved Pipe Connection
Flow Switch Set Point 15cm/sec
Factory Insulation - 0.75 inch
Low Ambient
5V Condenser Coil Modules
Round Copper Tube, Aluminum Plate Fin
EC Condenser Fan Motors
Variable Frequency Drive (1 Compr/CKT)
Single Point Unit Power Connection
Circuit Breaker High Fault Control Panel
High Short Circuit Rating
15A-115V Convenience Outlet
BACnet Interface (MS/TP)
Architectural Louvered Panels
Elastomeric Isolators
Reactor (>30% TDD)
English
Months-2 Parts Warranty Less Compressor
2nd - 5th Year Compressor Parts
1st Year Labor Warranty Whole Unit
1st Year Refrigerant Warranty

Additional Options:

1 year parts warranty included on Pumping Package.
Parts warranty on chiller by others
Labor warranty by others
Structural Steel Skid

Integral Pump Package with:

Pump: Taco CI2007D 2.5x2x7, 256 GPM @ 125 ft head, 30% PG, 3500 rpm, 15 HP, NEMA Premium Efficiency, TEFC, Shaft grounding rings
Multi Purpose Valve
Suction Diffusers
Air Separator
Non-ASME Expansion Tank: N-60V
Wessels Glycol Feed Tank: Wessels GMP-6
ASME Buffer Tank: 500 Gallons
Pump Isolation Valves
Pump Pressure Gauges
5" Pipe, Valves, and Fittings
2 – TR Style 15 HP VFD in NEMA 3R Enclosure

Performance Data - ACRB

Tags	165T 920rpm
Rated Capacity (AHRI) (tons)	163.81
Rated Efficiency (AHRI) (EER (Btu/W-h))	11.884
Trane Select Assist Version Number ( )	245
Capacity (tons)	171.97
Unit Power (kW)	168.29
Efficiency (EER (Btu/W-h))	12.263
IPLV (EER (Btu/W-h))	21.084
NPLV (EER (Btu/W-h))	21.496
Elevation (ft)	0.00
Compressor Speed Ckt 1 (rpm)	4700
Compressor Speed Ckt 2 (rpm)	4700
Fan Speed	Fan Speed 920
Fan Speed CKt 1 (rpm)	910
Fan Speed CKt 2 (rpm)	915
Number of Condenser Fans (Each)	10.00
FLA - Condenser Fans (each) (A)	2.70
Compressor 1A RLA (A)	117.00
Compressor 2A RLA (A)	117.00
Single Point Power MCA (A)	**313.00**
Single Point Power MOP (A)	400.00
Short Circuit Current Rating (A)	65000.00
Refrigerant Charge Ckt 1 (lb)	181
Refrigerant Charge Ckt 2 (lb)	181
Oil Charge Ckt 1 (gal)	3.00
Oil Charge Ckt 2 (gal)	3.00
Drive Cooling Ckt 1 (gal)	1.40
Drive Cooling Ckt 2 (gal)	2.00
Shipping Weight (lb)	**19342**
Operating Weight (lb)	**24379**
Length (in)	**352**
Width (in)	88
Height (in)	**105**
Evap Leaving Water Temperature (F)	55.00
Evap Entering Water Temperature (F)	72.00
Evap Flow Rate (gpm)	255.93
Evap Fluid Pressure Drop (ft H2O)	5.62
Pump Package PD (ft H2O)	8.00
Avail head pressure at water connection (ft H2O)	**111.38**
Evap Fouling Factor (hr-sq ft-deg F/ Btu)	0.000100
Evap Fluid Concentration (%)	30.00
Evap Fluid Freeze Point (F)	9.19
VPF Evap Min (gpm)	191.94
VPF Evap Min PD (ft H2O)	2.94
Saturated Evap Temp Ckt 1 (F)	43.48
Saturated Evap Temp Ckt 2 (F)	44.17
Ambient Air Temp (F)	95.00
Saturated Cond Temp Ckt 1 (F)	123.36
Saturated Cond Temp Ckt 2 (F)	123.56
A-Weighted Sound Pressure at full load (dBA)	71
A-Weighted Sound Pressure at 75% load (dBA)	63
A-Weighted Sound Pressure at 50% load (dBA)	54
A-Weighted Sound Pressure at 25% load (dBA)	50
A-Weighted Sound Power at full load (dBA)	98
A-Weighted Sound Power at 75% load (dBA)	91
A-Weighted Sound Power at 50% load (dBA)	83

Tag Data - ACRB (Qty: 1)

Item	Tag(s)	Qty	Description	Model Number
A1	CH-2	1	200T Ascend Model ACR Screw Chiller ACRB	ACRB2005EUA*EUUCXNC2XCNLCREV1HBCBXXAA1XXXT0XX

Product Data - ACRB

Item: A1 Qty: 1 Tag(s): CH-2

Air-Cooled Screw Chiller
Unit Startup By Trane
200 Nominal Tons
Screw w/ Variable Volume Ratio (GP4Vvi)
460 volt/60Hz/3 phase
Pueblo
Invisisound Ultimate
UL Listed-US/Canadian Safety Standard
ASME Pressure Vessel Code
Refrigerant Charge R-134A
AHRI Certified
ASHRAE 90.1 - 2016
Standard Cooling
Chil 2-pass
Propylene Glycol
Grooved Pipe Connection
Flow Switch Set Point 15cm/sec
Factory Insulation - 0.75 inch
Low Ambient
6V Condenser Coil Modules
Round Copper Tube, Aluminum Plate Fin
EC Condenser Fan Motors
Variable Frequency Drive (1 Compr/CKT)
Single Point Unit Power Connection
Circuit Breaker w/ High Fault Rated Control Panel
High Short Circuit Rating
15A-115V Convenience Outlet
BACnet Interface (MS/TP)
Architectural Louvered Panels
Elastomeric Isolators
Total Direct Free-Cooling
Reactor (>30% TDD)
Months-2 Parts Warranty Less Compressor
2nd - 5th Year Compressor Parts
1st Year Labor Warranty Whole Unit
1st Year Refrigerant Warranty

Additional Options:

1 year parts warranty included on Pumping Package.
Parts warranty on chiller by others
Labor warranty by others
Structural Steel Skid

Integral Pump Package with:

Pump: Taco CI2007D 2.5x2x7, 290.3 GPM @ 131 ft head, 30% PG, 3500 rpm, 15 HP, NEMA Premium Efficiency, TEFC, Shaft grounding rings
Multi Purpose Valve
Suction Diffusers
Air Separator
Non-ASME Expansion Tank: N-60V
Wessels Glycol Feed Tank: Wessels GMP-6
ASME Buffer Tank: 500 Gallons
Pump Isolation Valves
Pump Pressure Gauges
5" Pipe, Valves, and Fittings
6" Grooved System Connections
2 – TR Style 15 HP VFD in NEMA 3R Enclosure

Performance Data - ACRB

Tags	CH-2
Rated Capacity (AHRI) (tons)	191.75
Rated Efficiency (AHRI) (EER (Btu/W-h))	11.350
Trane Select Assist Version Number ( )	259
Capacity (tons)	195.19
Unit Power (kW)	204.06
Efficiency (EER (Btu/W-h))	11.479
IPLV (EER (Btu/W-h))	19.148
NPLV (EER (Btu/W-h))	0.000
Elevation (ft)	0.00
Compressor Speed Ckt 1 (rpm)	5645
Compressor Speed Ckt 2 (rpm)	5645
Fan Speed	Fan Speed 920
Fan Speed CKt 1 (rpm)	920
Fan Speed CKt 2 (rpm)	920
Number of Fans - Total Installed (Each)	12.00
FLA - Condenser Fans (each) (A)	2.70
Compressor 1A RLA (A)	131.00
Compressor 2A RLA (A)	131.00
Single Point Power MCA (A)	**349.00**
Single Point Power MOP (A)	450.00
Short Circuit Current Rating (A)	65000.00
Refrigerant Charge Ckt 1 (lb)	218
Refrigerant Charge Ckt 2 (lb)	218
Oil Charge Ckt 1 (gal)	3.00
Oil Charge Ckt 2 (gal)	3.00
Drive Cooling Ckt 1 (gal)	1.40
Drive Cooling Ckt 2 (gal)	2.00
Shipping Weight (lb)	**25120**
Operating Weight (lb)	**31446**
Length (in)	**462**
Width (in)	88
Height (in)	**105**
Evap Leaving Water Temperature (F)	55.00
Evap Entering Water Temperature (F)	72.01
Evap Flow Rate (gpm)	290.30
Evap Fluid Pressure Drop (ft H2O)	4.67
Free Cooling Full Load Pressure Drop (ft H2O)	12.76
Pump Package PD (ft H2O)	6.00
Avail head pressure at water connection (ft H2O)	**112.24**
Evap Fouling Factor (hr-sq ft-deg F/ Btu)	0.000100
Evap Fluid Concentration (%)	30.00
Evap Fluid Freeze Point (F)	9.19
Saturated Evap Temp Ckt 1 (F)	42.03
Saturated Evap Temp Ckt 2 (F)	42.68
Ambient Air Temp (F)	95.00
Saturated Cond Temp Ckt 1 (F)	124.89
Saturated Cond Temp Ckt 2 (F)	125.20
A-Weighted Sound Pressure at Full Load (dBA)	72
A-Weighted Sound Pressure at 75% load (dBA)	66
A-Weighted Sound Pressure at 50% load (dBA)	56
A-Weighted Sound Pressure at 25% load (dBA)	49
A-Weighted Sound Power at Full Load (dBA)	100
A-Weighted Sound Power at 75% load (dBA)	94
A-Weighted Sound Power at 50% load (dBA)	85
A-Weighted Sound Power at 25% load (dBA)	80

CAVANAUGHTOCCI

Unit Size	150	165	180	200	225	250	275	300
	InvisiSound ULTIMATE (Standard sound fan RPM)							
	ARI Rating Point - 100% load							
Fan RPM	920	902	920	876	920	920	920	920
Octaves	150	165	180	200	225	250	275	300
63	94	95	95	95	96	96	96	97
125	100	101	101	101	102	102	102	103
250	97	98	98	98	99	99	100	100
500	95	96	96	96	97	97	98	98
1000	95	95	95	95	96	96	97	97
2000	87	87	88	87	89	89	89	90
4000	81	82	82	82	83	83	84	84
8000	73	74	74	74	75	75	76	77
dBA	98	98	99	98	100	100	100	101

150	165	180	200	225	250	275	300
InvisiSound ULTIMATE (Standard sound fan RPM)							
ARI Rating Point - 75% load							
150	165	180	200	225	250	275	300
91	92	93	92	93	93	93	93
95	94	95	94	97	98	97	97
92	91	92	91	94	95	94	94
90	89	90	89	91	93	92	93
88	87	88	87	90	92	90	90
81	80	81	80	83	84	83	83
75	73	75	74	76	78	77	77
66	65	66	66	68	70	69	69
92	91	92	91	94	95	94	94

Fan RPM	150	165	180	200	225	250	275	300
	InvisiSound ULTIMATE (Standard sound fan RPM)							
	ARI Rating Point - 50% load							
Octaves	150	165	180	200	225	250	275	300
63	86	86	87	87	88	89	89	89
125	89	89	89	89	91	91	92	91
250	85	86	86	86	88	88	89	88
500	82	81	82	82	84	85	86	84
1000	78	78	79	77	80	81	81	80
2000	72	71	72	71	75	76	76	75
4000	65	65	65	65	67	69	69	68
8000	56	56	57	56	60	61	61	61
dBA	83	83	84	83	85	87	87	86

150	165	180	200	225	250	275	300
InvisiSound ULTIMATE (Standard sound fan RPM)							
ARI Rating Point - 25% load							
150	165	180	200	225	250	275	300
84	84	84	84	85	86	86	86
86	86	86	86	88	89	88	88
82	82	83	83	85	86	85	85
81	82	82	82	81	82	88	82
75	74	77	74	76	77	79	77
68	68	68	68	73	73	74	74
61	60	62	62	65	66	66	66
53	53	55	55	59	60	60	61
81	81	82	82	83	84	87	83

CFS-1 CU-1

CITYMULTI® **36-TON TURYE4324BN40A(N/B)** TRANE MITSUBISHI ELECTRIC

Job Name:

System Reference: **VRF-1-1**

CU-1 (OUTDOOR)

460V OUTDOOR VRF HEAT RECOVERY SYSTEM

UNIT OPTION

- ✓ Standard Model TURYE4324BN40AN
- Seacoast (BS) Model TURYE4324BN40AB

ACCESSORIES

- ✓ Twinning Kit (Required) CMY-R300NCBK
- ✓ BC Controller (Required) ..... for details see BC Controller Submittals
- Joint Kit ..... for details see Pipe Accessories Submittal
- Snow/Hail Guards Kit ..... for details see Snow/Hail Guards Kit Submittal

Specifications			System
Unit Type			TURYE4324BN40A(N/B)
Cooling Capacity (Nominal)		BTU/H	432,000
Heating Capacity (Nominal)		BTU/H	480,000
Net Weight		Lbs. [kg]	1836 [832]
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	1-1/8 [28.58] Brazed
	Gas (Low Pressure)	In. [mm]	1-5/8 [41.28] Brazed
Max. Total Refrigerant Line Length		Ft.	4920
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of outdoor unit capacity
	Model/Quantity		P05~P96/2.0~50.0
Sound Pressure Levels		dB(A)	69.5~70.0
Sound Power Levels		dB(A)	88.5/89.0
Compressor Operating Range			7.5% to 100.0%
AHRI Ratings (Ducted/Non-ducted)	EER		9.9/10.0
	IEER		17.8/20.8
	COP		3.2/3.2
	SCHE		19.6/22.4

CFS-1 CU-1, CU-4

CITYMULTI® **20-TON TURYE2404BN40A(N/B)** TRANE MITSUBISHI ELECTRIC

Job Name:
System Reference: **VRF-2-1,VRF-2-2**

CU-2, -4 (OUTDOOR)

460V OUTDOOR VRF HEAT RECOVERY SYSTEM

UNIT OPTION

- Standard Model TURYE2404BN40AN
- Seacoast (BS) Model TURYE2404BN40AB

ACCESSORIES

- ✓ Twinning Kit (Required) CMY-R200NCBK
- ✓ BC Controller (Required) ..... for details see BC Controller Submittals
- Joint Kit ..... for details see Pipe Accessories Submittal
- Panel Heater Kit ..... for details see Panel Heater Kit Submittal
- Snow/Hail Guards Kit ..... for details see Snow/Hail Guards Kit Submittal

Specifications			System
Unit Type			TURYE2404BN40A(N/B)
Cooling Capacity (Nominal)		BTU/H	240,000
Heating Capacity (Nominal)		BTU/H	270,000
Net Weight		Lbs. [kg]	1314 [596]
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	7/8 [22.2] Brazed
	Gas (Low Pressure)	In. [mm]	1-3/8 [34.93] Brazed
Max. Total Refrigerant Line Length		Ft.	2460
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of outdoor unit capacity
	Model/Quantity		P05~P96/2.0~50.0
Sound Pressure Levels		dB(A)	63.0~65.0
Sound Power Levels		dB(A)	83.0/83.5
Compressor Operating Range			7.5% to 100.0%
AHRI Ratings (Ducted/Non-ducted)	EER		11.7/12.2
	IEER		23.9/27.4
	COP		3.46/3.58
	SCHE		22.9/26.8

CFS-1 CU-3

CITYMULTI® **24-TON TURYE2884BN40A(N/B)** TRANE MITSUBISHI ELECTRIC

Job Name:
System Reference: **VRF-1-2**

CU-3 (OUTDOOR)

460V OUTDOOR VRF HEAT RECOVERY SYSTEM

UNIT OPTION

- Standard Model TURYE2884BN40AB
- Seacoast (BS) Model TURYE2884BN40AN

ACCESSORIES

- ✓ Twinning Kit (Required) CMY-R300NCBK
- ✓ BC Controller (Required) ..... for details see BC Controller Submittals
- Joint Kit ..... for details see Pipe Accessories Submittal
- Low Ambient Kit ..... for details see Low Ambient Kit Submittal
- Panel Heater Kit ..... for details see Panel Heater Kit Submittal
- Snow/Hail Guards Kit ..... for details see Snow/Hail Guards Kit Submittal

Specifications			System
Unit Type			TURYE2884BN40A(N/B)
Cooling Capacity (Nominal)		BTU/H	288,000
Heating Capacity (Nominal)		BTU/H	323,000
Net Weight		Lbs. [kg]	1430 [648]
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	1-1/8 [28.58] Brazed
	Gas (Low Pressure)	In. [mm]	1-3/8 [34.93] Brazed
Max. Total Refrigerant Line Length		Ft.	3116
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1640
Indoor Unit Connectable	Total Capacity		50.0~150.0% of outdoor unit capacity
	Model/Quantity		P05~P96/2.0~50.0
Sound Pressure Levels		dB(A)	68.0~68.5
Sound Power Levels		dB(A)	88.5/88.5
Compressor Operating Range			7.5% to 100.0%
AHRI Ratings (Ducted/Non-ducted)	EER		10.9/11.5
	IEER		23.1/27.4
	COP		3.26/3.46
	SCHE		21.7/24.5

CFS-1 CU-5

-300-

SPECIFICATIONS: TPKA0A0241KA70A & TRUZA0241HA70(N/B)A

CU-5 (OUTDOOR)

Outdoor Unit	MCA	A	19.0
	MOCP	A	26
	Fan Motor Full Load Amperage	A	0.4
	Fan Motor Output	W	86
	Airflow Rate	CFM	1940/1940
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Cooling on Heat Exchanger		Blue Fin Coating (BS Model only)
	Sound Pressure Level, Cooling[1]	dB(A)	47
	Sound Pressure Level, Heating[2]	dB(A)	48
	Compressor Type		INVERTER-driven twin rotary
	Compressor Model		SNB172FWHM1
	Compressor Rated Load Amps	A	7
	Compressor Locked Rotor Amps	A	11.0
	Compressor Oil Type // Charge	oz.	FV50S // 23
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		N/A
	Unit Dimensions	W x D x H: In. [mm]	37-13/32 x 13 (+1-3/16) x 37-1/8 [950 x 330 (+30) x 943]
	Package Dimensions	W x D x H: In. [mm]	40-15/16 x 17-11/16 x 40-11/16 [1040 x 450 x 1033]
	Unit Weight	Lbs. [kg]	153 [69]
	Package Weight	Lbs. [kg]	179 [81]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 0 DB
	Heating Air Temp [Maximum / Minimum]	°F	70 DB, 59 WB / -4 DB, -4 WB
	Heating Thermal Lock-out / Re-start Temperatures**	°F	-8 / -4
Refrigerant	Type		R410A
	Charge	Lbs, oz	7, 11.0
	Chargeless Piping Length	Ft. [m]	70.0 [20.0]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0.7 [50]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	5/8 [15.88]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	3/8 [9.52]
	Maximum Piping Length	Ft. [m]	165 [50]
	Maximum Height Difference	Ft. [m]	100 [30]
	Maximum Number of Bends		15

NOTES:
AHRI Rated Conditions
(Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor) °F 80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor) °F 70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor) °F 70 DB, 60 WB // 17 DB, 15 WB

CFS-1 CU-6, CU-7, CU-8

B.6 Liebert® MC Large Platform Sound Power Data

Table B.12 Sound Power Data for MCL055, dB

Sound Power (Measured One Fan)								
	Octave Band Data				A-Weighted, dBA			
Frequency (Hz)	Percent Fan Speed				Percent Fan Speed			
	20%	50%	80%	100%	20%	50%	80%	100%
63	50	70	76	81	24	43	49	54
125	51	68	77	88	35	52	61	71
250	52	66	77	83	43	57	68	75
500	56	64	77	83	53	60	74	80
1000	39	61	75	81	39	61	75	81
2000	33	55	71	79	34	56	72	80
4000	31[1]	49	65	72	32[1]	50	66	73
8000	29[1]	42	59	67	28[1]	41	58	66
Total	**59**	**74**	**84**	**91**	**54**	**65**	**79**	**86**

[1]These values indicate the upper boundary limit due to background noise levels. Actual field values may be equal to or less than that listed.

CFS-1 CU-9

SPECIFICATIONS: NTXCKS12A112AA & NTXSKS12A112AA

CU-9 (OUTDOOR)

Outdoor Unit	MCA	A	9.6
	MOCP	A	16
	Fan Motor Full Load Amperage	A	0.5
	Fan Motor Output	W	55
	Airflow Rate	CFM	1228/1172
	Refrigerant Control		LEV
	Defrost Method		Reverse Cycle
	Coating on Heat Exchanger		Blue Fin Coating
	Sound Pressure Level, Cooling[1]	dB(A)	49
	Sound Pressure Level, Heating[2]	dB(A)	51
	Compressor Type		DC INVERTER-driven Twin Rotary
	Compressor Model		SNB092FQAMT
	Compressor Rated Load Amps	A	6.6
	Compressor Locked Rotor Amps	A	8.2
	Compressor Oil Type // Charge	oz.	FV50S // 11.8
	External Finish Color		Ivory Munsell 3Y 7.8/1.1
	Base Pan Heater		Optional
	Unit Dimensions	W x D x H: In. [mm]	31-1/2 x 11-1/4 x 21-5/8 [800 x 285 x 550]
	Package Dimensions	W x D x H: In. [mm]	37 x 14-15/16 x 24-13/16 [940 x 380 x 630]
	Unit Weight	Lbs. [kg]	81 [37]
	Package Weight	Lbs. [kg]	88 [40]
Outdoor Unit Operating Temperature Range	Cooling Air Temp [Maximum / Minimum]*	°F	115 DB / 14 DB
	Cooling Thermal Lock-out / Re-start Temperatures**	°F	-1 / 3
	Heating Thermal Lock-out / Re-start Temperatures**	°F	-9 / -4
Refrigerant	Type		R410A
	Charge	Lbs, oz	2, 9.0
	Chargeless Piping Length	Ft. [m]	23.0 [7.0]
	Additional Refrigerant Charge Per Additional Piping Length	oz./Ft. [g/m]	0 [0]
Piping	Gas Pipe Size O.D. [Flared]	In.[mm]	3/8 [9.52]
	Liquid Pipe Size O.D. [Flared]	In.[mm]	1/4 [6.35]
	Maximum Piping Length	Ft. [m]	65 [20]
	Maximum Height Difference	Ft. [m]	40 [12]
	Maximum Number of Bends		10

NOTES:
AHRI Rated Conditions
(Rated data is determined at a fixed compressor speed)

[1]Cooling (Indoor // Outdoor) °F 80 DB, 67 WB // 95 DB, 75 WB
[2]Heating at 47°F (Indoor // Outdoor) °F 70 DB, 60 WB // 47 DB, 43 WB
[3]Heating at 17°F (Indoor // Outdoor) °F 70 DB, 60 WB // 17 DB, 15 WB

CFS-1 ERU-1

DOAS-1 Sound Data

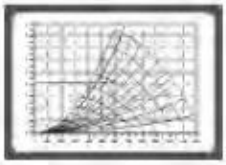
Sound Mitigation Package Radiated Sound Power Level (dBA)

63	125	250	500	1000	2000	4000	8000	Total dBA
68	**58**	**65**	**71**	**73**	**73**	**68**	**58**	**78**

Supply Fan

Input data					
Volume	5800 CFM	**Temperature**	68.0 °F	**Density**	0.075 lb/cu.ft
Static Pressure	4.21 In.W.G.	**Altitude**	0 ft	**Free Inlet - Free Outlet**	

	Catalogue data		
Selected Fan **ANPA 20 ALU**	n Max r/min	Pw Max BHP	J lb ft²
	2450		9.75



Fan Information											
c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM r/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	4.56	4.21	0.35	9520	1847	77.14	71.29	5.39			0.00

(*) Theoric value to obtained taking into account the dynamic pressure at the impeller outlet
(**) Theoric value, calculated at the impeller outlet

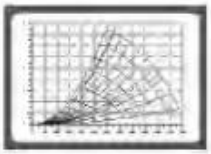
fm[Hz]		63	125	250	500	1000	2000	4000	8000	Tot.
Lw3 Total Sound Power Level in the inlet duct - Lwi Inlet Duct Sound Power Level includes the effect of duct end correction										
Level Lw3	**dB/dB(A)**	83 / 57	77 / 61	84 / 75	76 / 73	75 / 75	74 / 75	72 / 73	65 / 64	**88 / 82**
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction										
Level Lw5	**dB/dB(A)**	76 / 50	76 / 60	88 / 79	81 / 77	77 / 77	76 / 77	73 / 74	69 / 68	**89 / 84**
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction										
Level Lw6	**dB/dB(A)**	87 / 61	80 / 64	89 / 80	86 / 83	86 / 86	82 / 83	78 / 79	75 / 74	**94 / 90**

Motor Selected (nominal values)											
Manufacturer	Type	Size	Poles	RPM	Power HP	Voltage V	Frequency Hz	Rated efficiency %	Shaft diameter in	Efficiency class	Rated current A	Motor weight lb
Baldor	EM3710T	213T	4	1779	7.50	460	60	91.7	1 3/8	-	9.4	128.0

Exhaust Fan

Input data					
Volume	6123 CFM	**Temperature**	88.0 °F	**Density**	0.075 lb/cuft
Static Pressure	1.99 In.W.G	**Altitude**	0 ft	**Free Inlet - Free Outlet**	

	Catalogue data		
Selected Fan **ANPA 20 ALU**	n Max l/min	Pw Max BHP	J lb ft²
	2450		9.75



Fan Information										
c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM l/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	2.38	1.99	0.39	7916	1536	73.34	61.45	3.12			0.00

(*) Theoric value calculated taking into account the dynamic pressure at the impeller outlet

(**) Theoric value, calculated at the impeller outlet

fm[Hz]	63	125	250	500	1000	2000	4000	8000	Tot.
Lw3 Total Sound Power Level in the inlet duct- Lwi Inlet Duct Sound Power Level includes the effect of duct end correction									
Level Lw3 dB/dB(A)	77 / 51	73 / 57	83 / 75	71 / 68	78 / 74	69 / 70	67 / 68	60 / 59	**85 / 79**
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction									
Level Lw5 dB/dB(A)	73 / 47	75 / 59	87 / 78	79 / 76	76 / 76	74 / 75	69 / 70	64 / 63	**88 / 83**
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction									
Level Lw6 dB/dB(A)	83 / 57	78 / 62	88 / 79	84 / 81	84 / 84	79 / 80	76 / 77	72 / 71	**92 / 88**

Motor Selected (nominal values)												
Manufacturer	Type	Size	Poles	RPM	Power HP	Voltage V	Frequency Hz	Rated efficiency %	Shaft diameter in	Efficiency class	Rated current A	Motor weight lb
Baldor	EM3615T	184T	4	1770	5.00	460	60	89.5	1 1/8	–	6.7	93.0

CFS-1 ERU-2

DOAS-2 Sound Data

Sound Mitigation Package Radiated Sound Power Level (dBA)

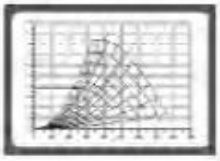
63	125	250	500	1000	2000	4000	8000	Total dBA
68	**58**	**65**	**71**	**73**	**73**	**68**	**58**	**78**

Supply Fan

Input data

Volume	5000 CFM	**Temperature**	88.0 °F	**Density**	0.075 lb/cu.ft
Static Pressure	3.84 In.W.G.	**Altitude**	0 ft	**Free Inlet - Free Outlet**	

	Catalogue data		
Selected Fan **ANPA 22 ALU**	n Max l/min	Pw Max BHP	J lb ft²
	2200		18.37



Fan Information

c ft/min	p tot * In.W.G.	p sta In.W.G.	p dyn ** In.W.G.	tip speed ft/min	RPM l/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	4.00	3.84	0.16	8593	1488	68.22	65.45	4.61			0.00

(*) Theoric value calculated taking into account the dynamic pressure at the impeller outlet

(**) Theoric value, calculated at the impeller outlet

fm[Hz]	63	125	250	500	1000	2000	4000	8000	Tot.
Lw3 Total Sound Power Level in the inlet duct - Lwi Inlet Duct Sound Power Level includes the effect of duct end correction									
Level Lw3 dB/dB(A)	95 / 69	90 / 74	89 / 80	77 / 74	73 / 73	70 / 71	67 / 68	62 / 61	**97 / 83**
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction									
Level Lw5 dB/dB(A)	76 / 50	78 / 62	88 / 79	77 / 74	74 / 74	73 / 74	71 / 72	67 / 66	**89 / 82**
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction									
Level Lw6 dB/dB(A)	92 / 66	88 / 72	89 / 80	84 / 81	83 / 83	77 / 78	74 / 75	70 / 69	**95 / 87**

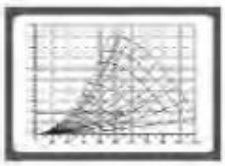
Motor Selected (nominal values)

Manufacturer	Type	Size	Poles	RPM	Power HP	Voltage V	Frequency Hz	Rated efficiency %	Shaft diameter in	Efficiency class	Rated current A	Motor weight lb
Baldor	EM3710T	213T	4	1770	7.50	460	60	91.7	1 3/8	-	9.4	128.0

Exhaust Fan

Input data					
Volume	5324 CFM	**Temperature**	68.0 °F	**Density**	0.075 lb/cu.ft
Static Pressure	1.88 in.W.G.	**Altitude**	0 ft	**Free Inlet - Free Outlet**	

	Catalogue data		
Selected Fan **ANPA 18 ALU**	n Max r/min	Pw Max BHP	I lb ft²
	2720		6.19



Fan Information											
c ft/min	p tot * in.W.G.	p sta in.W.G.	p dyn ** in.W.G.	tip speed ft/min	RPM r/min	eta Tot * %	eta Sta %	P fan BHP	Min Mot. BHP	P mot BHP	Shaft diameter in
	2.33	1.88	0.45	8071	1740	69.74	56.17	2.80			0.00

(*) Theoric value, calculated taking into account the dynamic pressure at the impeller outlet
(**) Theoric value, calculated at the impeller outlet

fm[Hz]		63	125	250	500	1000	2000	4000	8000	Tot.
Lw3 Total Sound Power Level in the inlet duct - Lwi Inlet Duct Sound Power Level includes the effect of duct end correction										
Level Lw3	**dB/dB(A)**	77 / 50	75 / 58	79 / 70	76 / 72	76 / 76	72 / 73	69 / 70	63 / 61	**84 / 80**
Lw5 Inlet Total Sound Power Level - Lwmi Inlet Sound Power Level (free inlet) do not includes the effect of duct end correction										
Level Lw5	**dB/dB(A)**	77 / 51	78 / 62	89 / 80	84 / 81	79 / 79	77 / 78	71 / 72	65 / 64	**91 / 86**
Lw6 Total Sound Power Level at the free outlet - Lwmo Outlet Sound Power Level (free outlet) do not includes the effect of duct end correction										
Level Lw6	**dB/dB(A)**	85 / 58	81 / 65	89 / 80	87 / 83	86 / 86	81 / 82	76 / 77	72 / 71	**93 / 90**

Motor Selected (nominal values)												
Manufacturer	Type	Size	Poles	RPM	Power HP	Voltage V	Frequency Hz	Rated efficiency %	Shaft diameter in	Efficiency class	Rated current A	Motor weight lb
Baldor	EM3615T	184T	4	1770	5.00	460	60	89.5	1 1/8	-	6.7	93.0

CFS-1 KEF-1, KMUA-1

KEF:

Appears to be incorrectly stated, OB levels sum directly up to the given LwA; these are actually OB PWL

KEF-1

USBI30DD-RM SOUND (944 RPM) AT 5 FT. IN OCTAVES:							
1	2	3	4	5	6	7	8
93.1	92.7	91.3	85.7	83	79.4	73.7	68.5

LWA:	89.1	Sones:	29	DBA:	77.6

MAU (less condensers):

Appears to be incorrectly stated, OB levels sum directly up to the given LwA; these are actually OB PWL

KMUA-1

A2-D.500-20D-MPU SOUND (1957 RPM) AT 5 FT. IN OCTAVES:							
1	2	3	4	5	6	7	8
77.3	84.9	88	83.3	79.3	75.8	73.2	70

LWA:	85.8	Sones:	23	DBA:	74.3

MAU (condensers):

A-WEIGHTED SOUND POWER LEVEL

UNIT SIZE	STANDARD RATING dBA	TYPICAL OCTAVE BAND SPECTRUM (dBA, without tone adjustment)						
		125	250	500	1000	2000	4000	8000
18–32	72	53.5	59.5	63.5	67.0	63.5	59.0	52.5
24–31	76	55.0	61.5	67.0	71.5	69.0	61.0	55.0
30–31, 51	74	55.0	63.5	68.5	68.5	65.5	61.0	54.0
36–31, 51, 61, 11	75	59.5	63.0	68.5	70.0	65.5	61.5	53.5
42–30, 50, 60	78	57.5	65.0	71.0	73.0	70.5	67.5	62.5
48–31, 51, 61, 11	80	58.5	67.5	73.5	75.0	70.5	67.5	64.5
60–32	78	59.0	67.5	71.5	73.5	69.0	66.0	63.5
60–52, 62, 12	79	59.5	69.5	72.5	73.5	71.0	68.0	63.5

NOTE: Tested in accordance with AHRI Standard 270–2008 (not listed in AHRI).

KMUA-1 CONDENSER

COOK

-314-

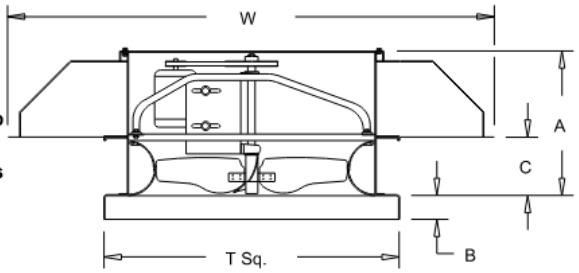
MARK: PRODUCTION-SUPPLY
PROJECT: CFS-SUMMER VENTILATION
DATE: 2/10/2021

HXSM

Hooded Supply Ventilator
Medium-Pressure Steel Propeller
Roof Mounted/Belt Drive

SF-1, -2, -3, -4

STANDARD CONSTRUCTION FEATURES:
X-stream steel propeller - Spun steel Venturi/curb cap - Lorenized steel lower housing - Galvanized steel hood - Birdscreen - Heavy duty steel power assembly - Welded curb cap corners - Adjustable pitch drives through 5 hp motor - Regreasable bearings in cast housing rated at 200,000 hours average life - Propellers are statically and dynamically balanced - Corrosion resistant fasteners - Oil and heat resistant, static conducting belts - All fans factory adjusted to specified RPM.
NOTE: Sizes 42-60 require field assembly of hood.



Performance (*Bhp includes 6% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
4	60HXSM11B	31250	.250	404	3.41	67	1.55

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
5	1725	460/3/60	ODP -PE	7.6	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
[illegible]

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
89	93	91	87	83	80	75	68	89	78	29

Accessories:

Dimensions (inches)

A	42
B	3
C	14-1/2
L x W	121 x 119
T Sq.	72
Base	14
Hood	18
Max Mtr Frame	256T
Roof Open.Sq.*	67-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	2092	Unit	1671

* ROOF OPENING SIZE FOR CURBS SUPPLIED BY COOK ONLY.
***Includes fan, motor & accessories.

Fan Curve

COOK

-315-

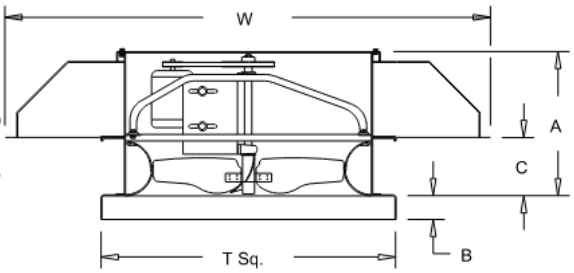
MARK: HTS-SUPPLY
PROJECT: CFS-SUMMER VENTILATION
DATE: 2/10/2021

HXSM

SF-5

Hooded Supply Ventilator
Medium-Pressure Steel Propeller
Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:
X-stream steel propeller - Spun steel Venturi/curb cap - Lorenized steel lower housing - Galvanized steel hood - Birdscreen - Heavy duty steel power assembly - Welded curb cap corners - Adjustable pitch drives through 5 hp motor - Regreasable bearings in cast housing rated at 200,000 hours average life - Propellers are statically and dynamically balanced - Corrosion resistant fasteners - Oil and heat resistant, static conducting belts - All fans factory adjusted to specified RPM.
NOTE: Sizes 42-60 require field assembly of hood.



Performance (*Bhp includes 15% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	20HXSM6B	2500	.250	991	.286	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
3/4	1725	460/3/60	ODP -SE	1.6	Yes

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
83	93	87	81	75	68	63	59	83	72	21

Accessories
DRIVES (1.5 SF) @ 991 RPM

Dimensions (inches)

A	-
B	2
C	-
L x W	52 x 52
T Sq.	32
Base	14
Hood	18
Max Mtr Frame	145T
Roof Open.Sq.*	27-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	474	Unit	319

* ROOF OPENING SIZE FOR CURBS SUPPLIED BY COOK ONLY.
***Includes fan, motor & accessories.

COOK

-316-

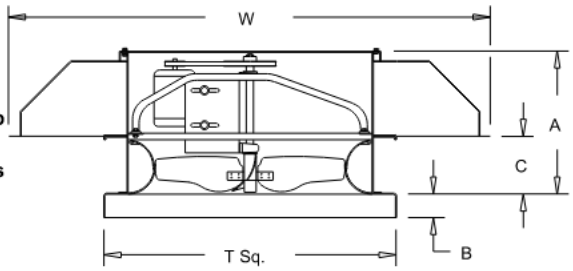
MARK: INVENTORY-SUPPLY
PROJECT: CFS-SUMMER VENTILATION
DATE: 2/10/2021

HXSM

SF-6

Hooded Supply Ventilator
Medium-Pressure Steel Propeller
Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:
X-stream steel propeller - Spun steel Venturi/curb cap - Lorenized steel lower housing - Galvanized steel hood - Birdscreen - Heavy duty steel power assembly - Welded curb cap corners - Adjustable pitch drives through 5 hp motor - Regreasable bearings in cast housing rated at 200,000 hours average life - Propellers are statically and dynamically balanced - Corrosion resistant fasteners - Oil and heat resistant, static conducting belts - All fans factory adjusted to specified RPM.
NOTE: Sizes 42-60 require field assembly of hood.



Performance (*Bhp includes 9% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	36HXSM7B	9050	.250	630	.938	n/a(<1HP)	1.65

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
1	1725	460/3/60	ODP -PE	2.1	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
[illegible]

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
89	91	88	82	76	70	65	59	84	73	22

Accessories

Dimensions (inches)

A	29
B	3
C	9-3/4
L x W	80 x 80
T Sq.	48
Base	14
Hood	18
Max Mtr Frame	215T
Roof Open.Sq.*	43-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	1096	Unit	833

* ROOF OPENING SIZE FOR CURBS SUPPLIED BY COOK ONLY.
***Includes fan, motor & accessories.

Fan Curve

COOK

-317-

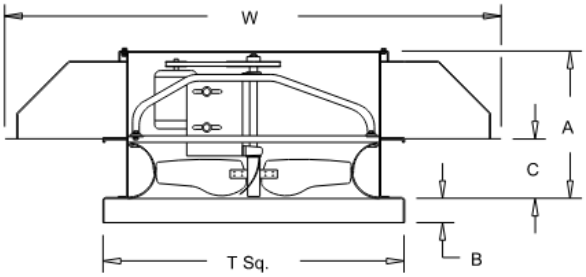
MARK: SHIP & RECEIV-SUPPLY	
PROJECT: CFS-SUMMER VENTILATION	
DATE: 2/10/2021	

HXSL

SF-7

Hooded Supply Ventilator
Low-Pressure Steel Propeller
Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:
X-stream steel propeller - Spun steel Venturi/curb cap - Lorenized steel lower housing - Galvanized steel hood - Birdscreen - Heavy duty steel power assembly - Welded curb cap corners - Adjustable pitch drives through 5 hp motor - Regreasable bearings in cast housing rated at 200,000 hours average life - Propellers are statically and dynamically balanced - Corrosion resistant fasteners - Oil and heat resistant, static conducting belts - All fans factory adjusted to specified RPM.
NOTE: Sizes 42-60 require field assembly of hood.



Performance (*Bhp includes 10% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	24HXSL7B	7000	.250	989	.821	n/a(<1HP)	1.49

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
1	1725	460/3/60	ODP -PE	2.1	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
Fla based on NEC (2017) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
87	86	85	80	76	72	69	64	82	71	20

Accessories

Dimensions (inches)

A	26
B	3
C	9-3/4
L x W	59 x 59
T Sq.	36
Base	14
Hood	18
Max Mtr Frame	182T
Roof Open.Sq.*	31-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	579	Unit	409

* ROOF OPENING SIZE FOR CURBS SUPPLIED BY COOK ONLY.
***Includes fan, motor & accessories.

Fan Curve

CFS-1 SF-8

COOK

-318-

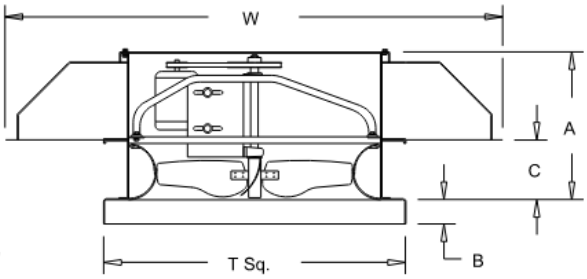
MARK: MACHINE ROOM-SUPPLY
PROJECT: CFS-SUMMER VENTILATION
DATE: 5/23/2021

HXSL

SF-8

Hooded Supply Ventilator
Low-Pressure Steel Propeller
Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:
X-stream steel propeller - Spun steel Venturi/curb cap - Lorenized steel lower housing - Galvanized steel hood - Birdscreen - Heavy duty steel power assembly - Welded curb cap corners - Adjustable pitch drives through 5 hp motor - Regreasable bearings in cast housing rated at 200,000 hours average life - Propellers are statically and dynamically balanced - Corrosion resistant fasteners - Oil and heat resistant, static conducting belts - All fans factory adjusted to specified RPM.
NOTE: Sizes 42-60 require field assembly of hood.



Performance (*Bhp includes 7% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	48HXSL10B	18000	.250	442	2.25	67	1.38

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
3	1725	460/3/60	ODP -PE	4.8	Yes	Yes

NEMA Premium® efficient motor per MG1-12 Table 12-12
FLA based on NEC (2017) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
91	95	90	82	77	73	69	63	86	75	26

Accessories:

Dimensions (inches)

A	39
B	3
C	9-3/4
L x W	110 x 90
T Sq.	60
Base	14
Hood	18
Max Mtr Frame	254T
Roof Open.Sq.*	55-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	1529	Unit	1165

* ROOF OPENING SIZE FOR CURBS SUPPLIED BY COOK ONLY.
***Includes fan, motor & accessories.

CAVANAUGHTOCCI

COOK

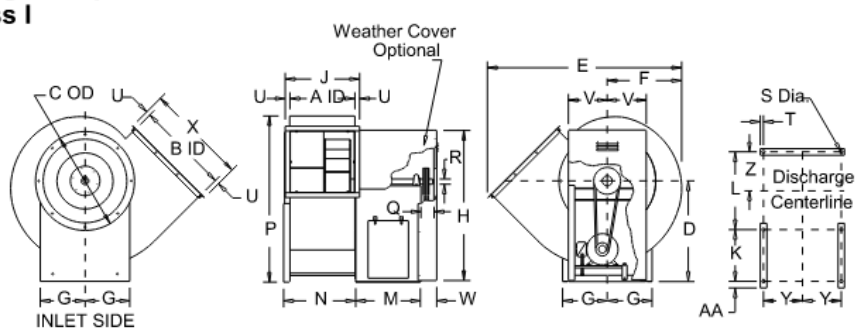
-319-

MARK: 800 CFM UTILITY
PROJECT: CFS-2-25-21
DATE: 2/25/2021

CPS

Flat Blade Centrifugal Blower
Clockwise Bottom Angular Up
Arrangement 10, Class I

SF-11



Performance (*Bhp includes 12% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	100CPS	800	2.50	2675	.602	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
3/4	1725	460/3/60	TEFC -SE	1.6	Yes

FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	1392	CW	Bottom Ang. Up	3:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	82	84	80	77	72	67	63	58	78	67
Outlet	90	88	82	80	74	70	65	59	81	70

Dimensions (inches)

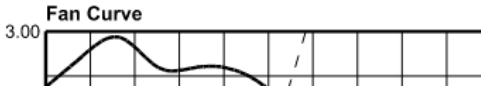
A	7-9/16	L	10-1/4	W	4
B	10-15/16	M	13-1/8	X	14-1/16
C	14-1/8	N	9-3/8	Y	8-5/8
D	18	P	28-1/8	Z	4-5/8
E	26-11/16	Q	3	AA	1-1/2
F	8-7/8	R	1		
G	9-3/8	S	9/16		
H	25-1/4	T	3/4		
J	10-3/4	U	1-5/8		
K	10	V	8		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	282	Unit	204

***Includes fan, motor & accessories.

Fan Curve



CFS-1 EF-1 through EF-4

COOK

-321-

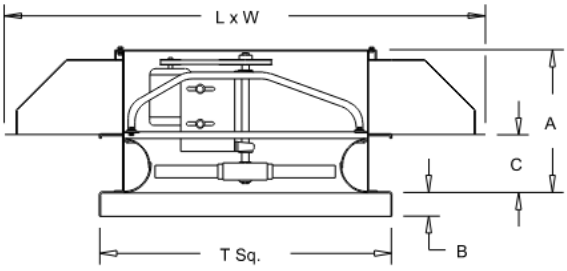
MARK: PRODUCTION
PROJECT: CFS-SUMMER VENTILATION
DATE: 2/10/2021

HEE

Hooded Exhaust Ventilator
Extruded Aluminum Propeller
Roof Mounted/Belt Drive

EF-1, -2, -3, -4

STANDARD CONSTRUCTION FEATURES:
Extruded aluminum propeller - Spun steel Venturi/curb cap - Painted steel lower housing - Galvanized steel hood - Birdscreen - Heavy duty steel power assembly - Welded curb cap corners - Adjustable pitch drives through 5 hp motor - Regreasable bearings in a cast housing rated at 200,000 hours average life - Propellers are statically and dynamically balanced - Corrosion resistant fasteners - Oil and heat resistant, static conducting belts - All fans factory adjusted to specified RPM.
NOTE: Sizes 42-72 require field assembly of hood.



Performance (*Bhp includes 6% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
4	54HEE11B	31250	.125	537	3.61	53	1.20

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
5	1725	460/3/60	ODP -PE	7.6	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
91	90	86	84	85	84	79	74	90	78	31

Dimensions (inches)

A	44-1/2
B	3
C	14-3/4
L x W	111x109
T Sq.	66
Roof Open. Sq.*	61-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	1708	Unit	1319

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

CAVANAUGHTOCCI

CFS-1 EF-5

COOK

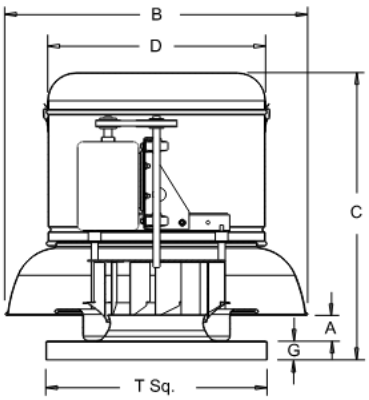
-322-

MARK: HTS
PROJECT: CFS-SUMMER VENTILATION
DATE: 2/10/2021

ACE-B

EF-5

Downblast Centrifugal
Exhaust Ventilator
Roof Mounted/Belt Drive



STANDARD CONSTRUCTION FEATURES:
All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.

Performance (*Bhp includes 14% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	165C5B	2500	.250	998	.370	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
1/2	1725	115/1/60	ODP -SE	9.8	Yes

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
74	77	76	69	67	62	56	50	73	61	10.8

Dimensions (inches)

A	3-9/16
B	32-7/8
C	29-3/8
D	23-3/4
G	2
T Sq.	24
Roof Open.Sq.*	19-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	138	Unit	112

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

CAVANAUGHTOCCI

COOK

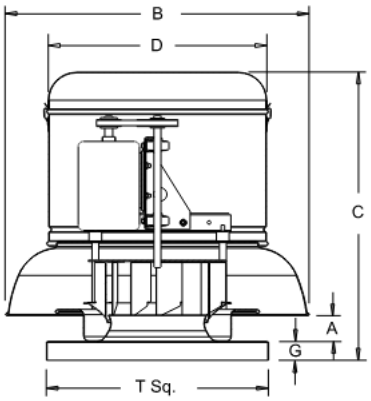
-323-

MARK: INVENTORY
PROJECT: CFS-SUMMER VENTILATION
DATE: 2/10/2021

ACE-B

EF-6

Downblast Centrifugal
Exhaust Ventilator
Roof Mounted/Belt Drive



STANDARD CONSTRUCTION FEATURES:
All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.

Performance (*Bhp includes 7% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	300C9B	9050	.250	569	1.58	60	1.00

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
2	1725	460/3/60	ODP -PE	3.4	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA taken from NEC (2017) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
83	84	81	73	71	67	58	51	77	66	14.7

Accessories

Dimensions (inches)

A	7-1/16
B	52-5/8
C	49-1/16
D	39-3/8
G	3
T Sq.	36
Roof Open.Sq.*	31-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	441	Unit	277

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

CAVANAUGHTOCCI

COOK

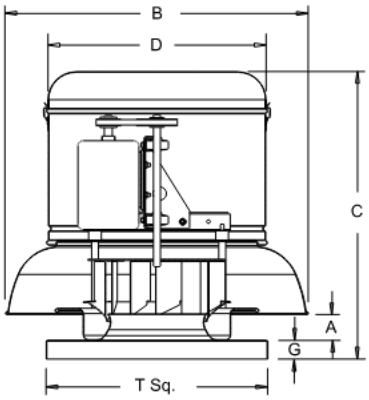
-324-

MARK: SHIPPING & RECEIVING
PROJECT: CFS-SUMMER VENTILATION
DATE: 2/10/2021

ACE-B

EF-7

Downblast Centrifugal Exhaust Ventilator Roof Mounted/Belt Drive



STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.

Performance (*Bhp includes 9% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	270C8B	7000	.250	609	1.16	60	1.07

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
1-1/2	1725	460/3/60	ODP -PE	3	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
80	81	77	72	69	62	57	52	75	63	12.4

Dimensions (inches)

A	6-1/8
B	47-5/8
C	39-7/8
D	35-7/8
G	3
T Sq.	36
Roof Open.Sq.*	31-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	359	Unit	218

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

COOK

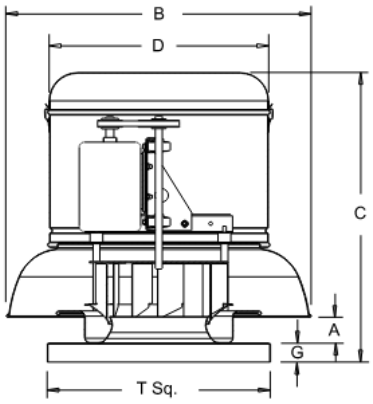
-324-

MARK: SHIPPING & RECEIVING
PROJECT: CFS-SUMMER VENTILATION
DATE: 2/10/2021

ACE-B

EF-7

Downblast Centrifugal
Exhaust Ventilator
Roof Mounted/Belt Drive



STANDARD CONSTRUCTION FEATURES:
All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.

Performance (*Bhp includes 9% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	270C8B	7000	.250	609	1.16	60	1.07

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
1-1/2	1725	460/3/60	ODP -PE	3	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
80	81	77	72	69	62	57	52	75	63	12.4

Dimensions (inches)

A	6-1/8
B	47-5/8
C	39-7/8
D	35-7/8
G	3
T Sq.	36
Roof Open.Sq.*	31-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	359	Unit	218

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

CFS-1 EF-8

COOK

-325-

MARK: 900 CFM DOME FAN
PROJECT: CFS-2-25-21
DATE: 2/25/2021

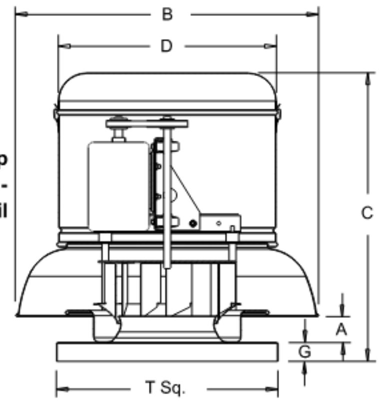
ACE-B

EF-8

Downblast Centrifugal Exhaust Ventilator Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.



Performance (*Bhp includes 18% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	120C2B	900	.500	1187	.141	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
1/6	1725	115/1/60	ODP -SE	4.4	Yes

FLA based on NEC 2017 Table 430.248

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
65	68	71	62	59	56	50	46	66	54	7.2

Dimensions (inches)

A	1-13/16
B	28-7/16
C	26-7/8
D	20-5/16
G	2
T Sq.	20
Roof Open.Sq.*	15-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	96	Unit	80

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

COOK

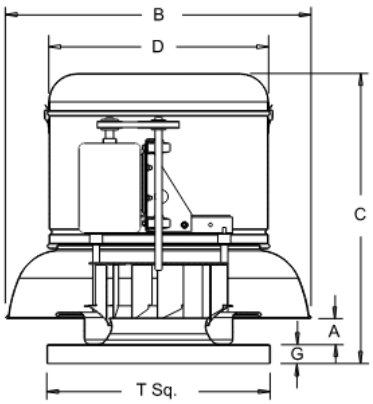
-326-

MARK: 200 CFM DOME FAN
PROJECT: CFS-2-25-21
DATE: 2/25/2021

ACE-B

Downblast Centrifugal Exhaust Ventilator Roof Mounted/Belt Drive

EF-9



STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.

Performance (*Bhp includes 18% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	70C2B	200	.500	1504	.129	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
1/6	1725	115/1/60	ODP -SE	4.4	Yes

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
78	73	76	62	58	52	49	45	69	57	9.0

Dimensions (inches)

A	2-7/8
B	23-9/16
C	21-1/8
D	16-11/16
G	2
T Sq.	18
Roof Open.Sq.*	13-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	73	Unit	65

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

COOK

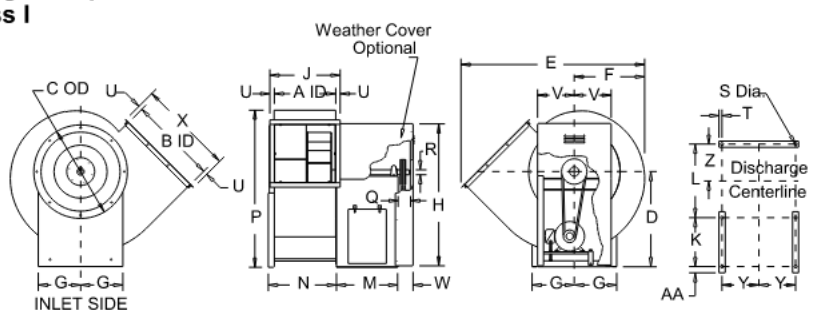
-327-

MARK: 800 CFM UTILITY
PROJECT: CFS-2-25-21
DATE: 2/25/2021

CPS

Flat Blade Centrifugal Blower
Clockwise Bottom Angular Up
Arrangement 10, Class I

EF-11



Performance (*Bhp includes 12% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	100CPS	800	2.50	2675	.602	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
3/4	1725	460/3/60	TEFC -SE	1.6	Yes

FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	1388	CW	Bottom Ang. Up	3:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	82	84	80	77	72	67	63	58	78	67
Outlet	90	88	82	80	74	70	65	59	81	70

Dimensions (inches)

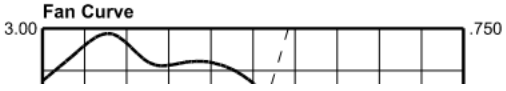
A	7-9/16	L	10-1/4	W	4
B	10-15/16	M	13-1/8	X	14-1/16
C	14-1/8	N	9-3/8	Y	8-5/8
D	18	P	28-1/8	Z	4-5/8
E	26-11/16	Q	3	AA	1-1/2
F	8-7/8	R	1		
G	9-3/8	S	9/16		
H	25-1/4	T	3/4		
J	10-3/4	U	1-5/8		
K	10	V	8		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	282	Unit	204

***Includes fan, motor & accessories.

Fan Curve



CFS-1 EF-14

COOK

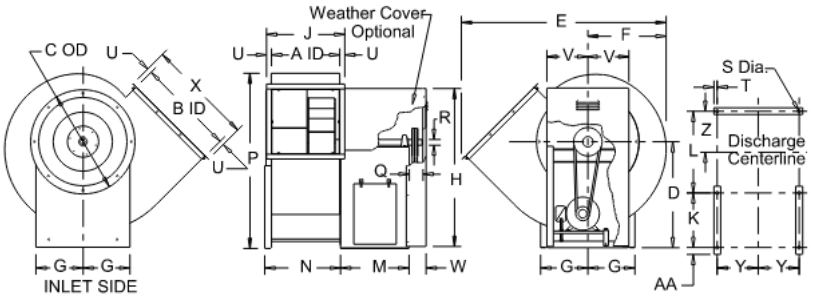
-328-

MARK: 4500 CFM UTILITY SET
PROJECT: CFS-2-25-21
DATE: 2/25/2021

CPS-A

Airfoil Centrifugal Blower
Clockwise Bottom Angular Up
Arrangement 10, Class I

EF-14



Performance (*Bhp includes 6% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	165 CPS-A	4500	2.50	2253	3.43	85	1.13

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
5	1725	460/3/60	ODP -PE	7.6	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	2841	CW	Bottom Ang. Up	3:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	88	87	88	86	80	80	79	75	88	77
Outlet	95	89	90	88	84	83	79	74	90	79

Dimensions (inches)

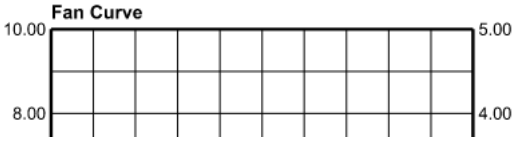
A	12-5/8	L	15-5/16	W	4
B	18-1/16	M	15-1/8	X	21-1/4
C	21-3/16	N	14-7/16	Y	8-5/8
D	20-7/16	P	33-3/16	Z	7-3/16
E	40	Q	3	AA	1-1/2
F	14-5/8	R	1		
G	9-3/8	S	9/16		
H	31-7/16	T	3/4		
J	15-13/16	U	1-5/8		
K	12	V	8		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	525	Unit	410

***Includes fan, motor & accessories.

Fan Curve



CAVANAUGHTOCCI

CFS-1 EF-16

-329-

COOK

MARK: 600 CFM DOME FAN
PROJECT: CFS-2-25-21
DATE: 2/25/2021

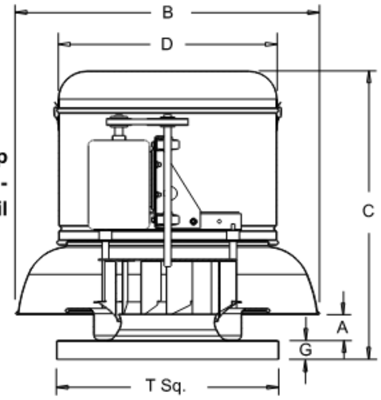
ACE-B

EF-16

Downblast Centrifugal Exhaust Ventilator Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.



Performance (*Bhp includes 18% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	100C2B	600	.500	1495	.117	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
1/6	1725	115/1/60	ODP -SE	4.4	Yes

FLA based on NEC 2017 Table 430.248

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
67	69	73	66	61	57	52	48	69	57	8.4

Dimensions (inches)

A	2-7/8
B	23-9/16
C	21-1/8
D	16-11/16
G	2
T Sq.	18
Roof Open.Sq.*	13-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	73	Unit	65

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

CFS-1 EF-17

COOK

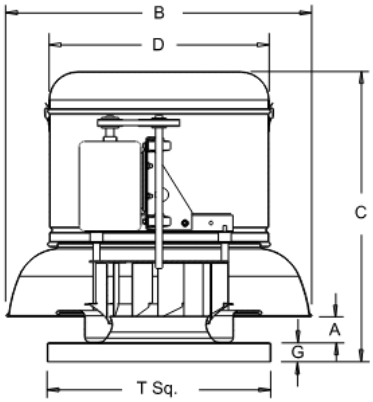
-330-

MARK: MACHINE ROOM
PROJECT: CFS-SUMMER VENTILATION
DATE: 5/23/2021

ACE-B

Downblast Centrifugal Exhaust Ventilator Roof Mounted/Belt Drive

EF-17



STANDARD CONSTRUCTION FEATURES:

All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.

Performance (*Bhp includes 7% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	445C10B	18000	.250	380	2.98	56	1.05

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
3	1725	460/3/60	ODP -PE	4.8	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
87	86	79	75	72	65	57	51	78	66	15.7

Accessories:

Dimensions (inches)

A	9-3/4
B	75-3/16
C	57-1/16
D	53-7/8
G	3
T Sq.	54
Roof Open.Sq.*	49-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	695	Unit	345

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

CAVANAUGHTOCCI

COOK

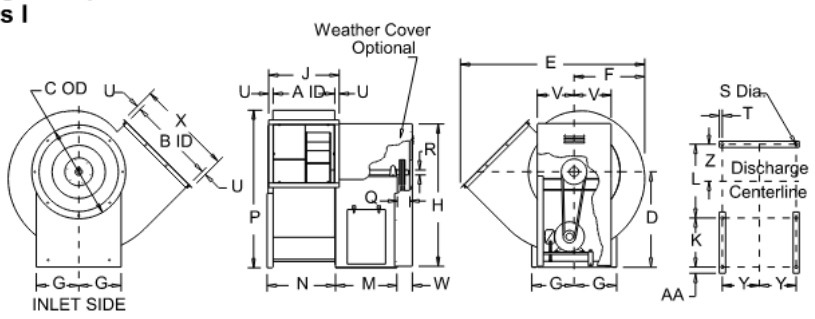
CPS

Flat Blade Centrifugal Blower
Clockwise Bottom Angular Up
Arrangement 10, Class I

-331-

MARK: EF-18
PROJECT: CFS-SUMMER VENTILATION
DATE: 10/10/2021

EF-18



Performance (*Bhp includes 7% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI	Speed Control
1	195 CPS	4000	3.00	1515	2.77	85	1.31	VSD

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
3	1725	460/3/60	ODP -PE	4.8	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	1809	CW	Bottom Ang. Up	3:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	84	81	82	77	73	71	65	61	80	68
Outlet	91	81	88	79	78	73	69	67	84	72

Dimensions (inches)

A	14-15/16	L	17-5/8	W	4
B	21-5/16	M	18-1/8	X	24-1/2
C	24-3/16	N	16-3/4	Y	9-5/8
D	23-11/16	P	38-1/4	Z	8-5/16
E	45-15/16	Q	3	AA	1-1/2
F	17-1/4	R	1-3/16		
G	10-3/8	S	9/16		
H	35-11/16	T	3/4		
J	18-3/16	U	1-5/8		
K	15	V	9		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	624	Unit	484

***Includes fan, motor & accessories.

Fan Curve

CFS-1 EF-23

COOK

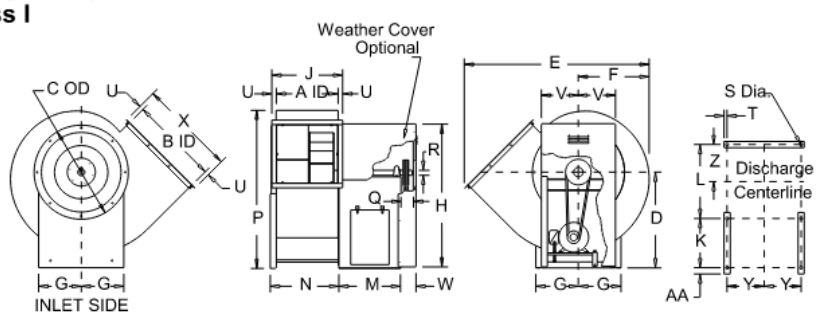
-332-

MARK: EF-23	
PROJECT: CFS-MAGNET-EF-23	
DATE: 3/12/2022	

CPS

Flat Blade Centrifugal Blower
Clockwise Bottom Angular Up
Arrangement 10, Class I

EF-23



Performance (*Bhp includes 5% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	195 CPS	6200	3.00	1739	4.78	85	1.23

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
5	1725	460/3/60	ODP -PE	7.6	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	2804	CW	Bottom Ang. Up	3:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	86	85	85	83	79	76	70	65	85	73
Outlet	94	89	91	88	84	79	73	70	89	78

Dimensions (inches)

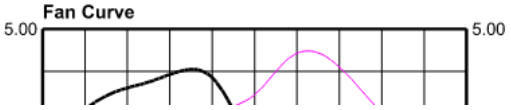
A	14-15/16	L	17-5/8	W	4
B	21-5/16	M	18-1/8	X	24-1/2
C	24-3/16	N	16-3/4	Y	9-5/8
D	23-11/16	P	38-1/4	Z	8-5/16
E	45-15/16	Q	3	AA	1-1/2
F	17-1/4	R	1-3/16		
G	10-3/8	S	9/16		
H	35-11/16	T	3/4		
J	18-3/16	U	1-5/8		
K	15	V	9		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	626	Unit	488

***Includes fan, motor & accessories.

Fan Curve



CAVANAUGHTOCCI

CFS-1 EF-24

COOK

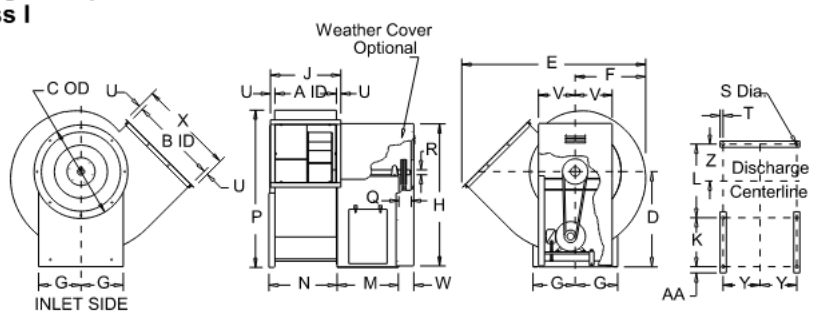
-333-

MARK: EF-24
PROJECT: CFS-MAGNET-5-13-22
DATE: 5/18/2022

CPS

Flat Blade Centrifugal Blower
Clockwise Bottom Angular Up
Arrangement 10, Class I

EF-24



Performance (*Bhp includes 9% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	100CPS	1020	3.00	3095	.917	n/a(<1HP)	1.08

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
1	3450	460/3/60	TEFC -PE	2.1	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	1775	CW	Bottom Ang. Up	3:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	88	91	81	79	77	70	67	62	82	70
Outlet	92	91	83	84	77	74	69	63	85	73

Dimensions (inches)

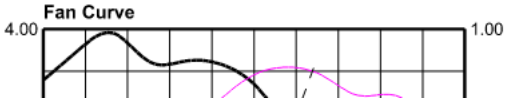
A	7-9/16	L	10-1/4	W	4
B	10-15/16	M	13-1/8	X	14-1/16
C	14-1/8	N	9-3/8	Y	8-5/8
D	18	P	28-1/8	Z	4-5/8
E	26-11/16	Q	3	AA	1-1/2
F	8-7/8	R	1		
G	9-3/8	S	9/16		
H	25-1/4	T	3/4		
J	10-3/4	U	1-5/8		
K	10	V	8		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	287	Unit	209

***Includes fan, motor & accessories.

Fan Curve



CAVANAUGHTOCCI

COOK

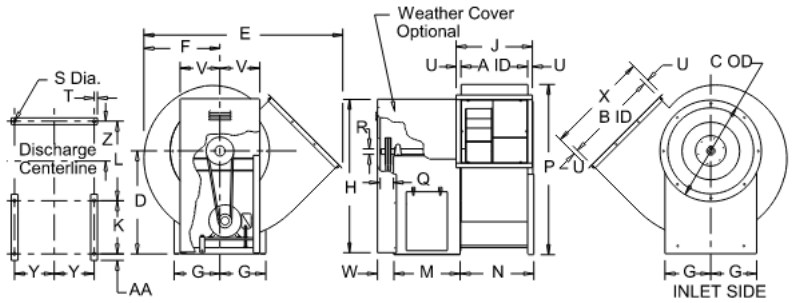
-334-

MARK: EF-26
PROJECT: CFS-MAGNET-5-13-22
DATE: 5/18/2022

CPS

Flat Blade Centrifugal Blower
Counterclockwise Bottom Angular Up
Arrangement 10, Class I

EF-26



Performance (*Bhp includes 12% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	70CPS	350	3.00	3013	.582	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
3/4	3450	460/3/60	TEFC -SE	1.6	Yes

FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	609	CCW	Bottom Ang. Up	9:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	83	88	88	81	77	68	67	62	84	72
Outlet	99	93	88	89	80	76	71	64	89	77

Dimensions (inches)

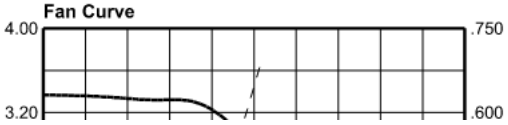
A	7-9/16	L	10-1/4	W	4
B	10-15/16	M	13-1/8	X	14-1/16
C	14-1/8	N	9-3/8	Y	8-5/8
D	18	P	28-1/8	Z	4-5/8
E	26-11/16	Q	3	AA	1-1/2
F	8-7/8	R	1		
G	9-3/8	S	9/16		
H	25-1/4	T	3/4		
J	10-3/4	U	1-5/8		
K	10	V	8		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	283	Unit	205

***Includes fan, motor & accessories.

Fan Curve



TRANE

Submittal

RTU-1

Prepared For:
ESI

Sold To:

Date: *February 10, 2021*

Customer P.O. Number:
Customer Project Number:

Job Number:
Job Name:
ESI- CFS- 111 Hospital

Trane U.S. Inc. dba Trane is pleased to provide the enclosed submittal for your review and approval.

Product Summary

Qty	Product
4	Packaged Rooftop, Cooling / Heating Units
1	Packaged Gas/Electric Rooftop Units

NOTE- OUTDOOR SOUND DATA ON PAGEs 5 and 12 (fan curve) for the 30 ton RTUs has been updated to be

YC_360 (eStage) - EBM with compressor enclosures

	63	125	250	500	1k	2k	4k	8k	
Component 1:	79.2	73.5	69.9	71.1	68.3	65.4	61.9	58.1	EBM - 8600 cfm, 0.3"sp - 1 fan
Component 2:	79.2	73.5	69.9	71.1	68.3	65.4	61.9	58.1	EBM - 8600 cfm, 0.3"sp - 1 fan
Component 3:	79.2	73.5	69.9	71.1	68.3	65.4	61.9	58.1	EBM - 8600 cfm, 0.3"sp - 1 fan
Component 4:	81.0	61.4	57.1	56.0	57.4	57.6	43.6	40.6	(1) Compressor with enclosure
Component 5:	81.0	61.4	57.1	56.0	57.4	57.6	43.6	40.6	(1) Compressor with enclosure
Component 6:	81.0	61.4	57.1	56.0	57.4	57.6	43.6	40.6	(1) Compressor with enclosure
Sum:	88.0	78.5	74.9	76.0	73.4	70.9	66.7	62.9	
						Rating:	78.6 dBA		

OUTDOOR SOUND DATA for the 19 ton RTU has been updated on page 18 to be

YHD240 - EBM and Compressor Enclosures

	63	125	250	500	1k	2k	4k	8k	
Component 1:	78.0	71.5	66.3	66.9	64.4	61.2	57.0	49.9	EBM - 8250 cfm, 0.15", 1 fan
Component 2:	78.0	71.5	66.3	66.9	64.4	61.2	57.0	49.9	EBM - 8250 cfm, 0.15", 1 fan
Component 3:	83.0	78.4	78.1	58.0	52.4	44.6	47.6	46.6	(2) Compressors with Enclosure
Sum:	88.1	79.9	78.6	70.2	67.5	64.3	60.3	53.8	
						Rating:	74.6 dBA		

Baltimore Aircoil Company
Cooling Tower Selection Report

CT-HVAC-1,-2 (mitigated case) at 100% load

Version:	8.11.17 NA
Product data correct as of:	April 29, 2022
Project Name:	Comm Fusion
Selection Name:	
Project State/Province:	Massachusetts
Project Country/Region:	United States
Date:	May 03, 2022

Note these data shown are for (2) units, not (1) unit

Model Information

Product Line: Series 3000
Model: S3E-1424-13Q
Number of Units: 2
Fan Type: Whisper Quiet Fan (2020 Version)
Fan Motor: (1) 50.00 - 50.00 HP/Unit

IBC 2018 Code Compliance No
California OSHPD Project No
Special Seismic Certification No
Intake Option: None
Internal Option: None
Discharge Option None

Total Standard Fan Power: Full Speed, 50.00 BHP/Unit

Octave band and A-weighted sound pressure levels (Lp) are expressed in decibels (dB) reference 0.0002 microbar. Sound power levels (Lw) are expressed in decibels (dB) reference one picowatt. Octave band 1 has a center frequency of 63 Hertz.

Top
Sound Pressure (dB)

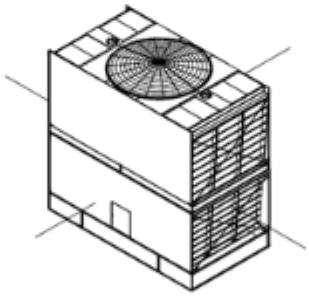
Octave Band	Distance 5 ft.	Distance 50 ft.
1	79	70
2	78	68
3	73	65
4	69	59
5	69	58
6	66	55
7	62	53
8	56	46
A-wgtd	**74**	**64**

Air Inlet
Sound Pressure (dB)

Octave Band	Distance 5 ft.	Distance 50 ft.
1	79	70
2	76	67
3	71	59
4	69	58
5	65	55
6	57	50
7	57	48
8	54	44
A-wgtd	**70**	**60**

End
Sound Pressure (dB)

Octave Band	Distance 5 ft.	Distance 50 ft.
1	71	68
2	71	62
3	66	56
4	61	50
5	56	47
6	50	42
7	45	35
8	39	27
A-wgtd	**63**	**54**



End
Sound Pressure (dB)

Octave Band	Distance 5 ft.	Distance 50 ft.
1	71	68
2	71	62
3	66	56
4	61	50
5	56	47
6	50	42
7	45	35
8	39	27
A-wgtd	**63**	**54**

Air Inlet
Sound Pressure (dB)

Octave Band	Distance 5 ft.	Distance 50 ft.
1	79	70
2	76	67
3	71	59
4	69	58
5	65	55
6	57	50
7	57	48
8	54	44
A-wgtd	**70**	**60**

Total Sound Power (dB)

Octave Band	Center Frequency (Hertz)	Lw
1	63	103
2	125	101
3	250	96
4	500	92
5	1000	90
6	2000	87
7	4000	85
8	8000	78
A-wgtd		**96**

Note: The use of frequency inverters (variable frequency drives) can increase sound levels.
Extra Notes: Sound data provided by CTI ATC-128 sound test code revision 2019

CT-PROCESS-1,-2 (mitigated case) at 100% load

Baltimore Aircoil Company, Inc.
Cooling Tower Selection Program

Project Name: CFS - SPARC
Selection Name:
Project State/Province: MA
Project Country: US
Date: March 7, 2023

Note these data shown are for (2) units, not (1) unit

Model Information

Product Line: New Series 3000
Model: S3E-1424-14W ENDURA
Number of Units: 2
Fan Type: Whisper Quiet Fan
Fan Motor: (1) 125 = 125 HP/Unit
Total Standard Fan Power: 100% of Full Speed, 125 BHP/Unit

Intake Option: None
Internal Option: None
Discharge Option: None

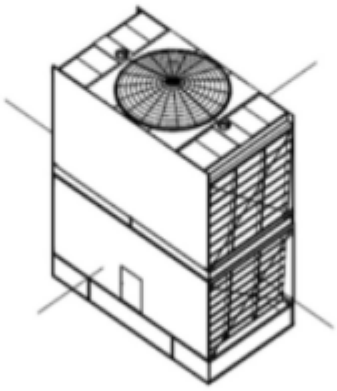
Octave band and A-weighted sound pressure levels (Lp) are expressed in decibels (dB) reference 0.0002 microbar. Sound power levels (Lw) are expressed in decibels (dB) reference one picowatt. Octave band 1 has a center frequency of 63 Hertz.

Top Lp
Sound Pressure (dB)

Octave Band	Distance 5 ft	Distance 50 ft
1	88	79
2	86	77
3	80	72
4	77	67
5	76	65
6	70	60
7	66	57
8	61	51
A-wgtd	**80**	**70**

Air Inlet Lp
Sound Pressure (dB)

Octave Band	Distance 5 ft	Distance 50 ft
1	87	79
2	82	74
3	76	65
4	74	64
5	70	61
6	63	54
7	59	49
8	55	46
A-wgtd	**76**	**66**



End Lp
Sound Pressure (dB)

Octave Band	Distance 5 ft	Distance 50 ft
1	79	75
2	77	69
3	71	62
4	66	59
5	61	54
6	56	46
7	48	38
8	42	31
A-wgtd	**68**	**61**

End Lp
Sound Pressure (dB)

Octave Band	Distance 5 ft	Distance 50 ft
1	79	75
2	77	69
3	71	62
4	66	59
5	61	54
6	56	46
7	48	38
8	42	31
A-wgtd	**68**	**61**

Air Inlet Lp
Sound Pressure (dB)

Octave Band	Distance 5 ft	Distance 50 ft
1	87	79
2	82	74
3	76	65
4	74	64
5	70	61
6	63	54
7	59	49
8	55	46
A-wgtd	**76**	**66**

Sound Power/ Unit (dB)

Octave Band	Center Frequency (Hertz)	Lw
1	63	112
2	125	109
3	250	104
4	500	99
5	1000	97
6	2000	92
7	4000	89
8	8000	83
A-wgtd		**103**

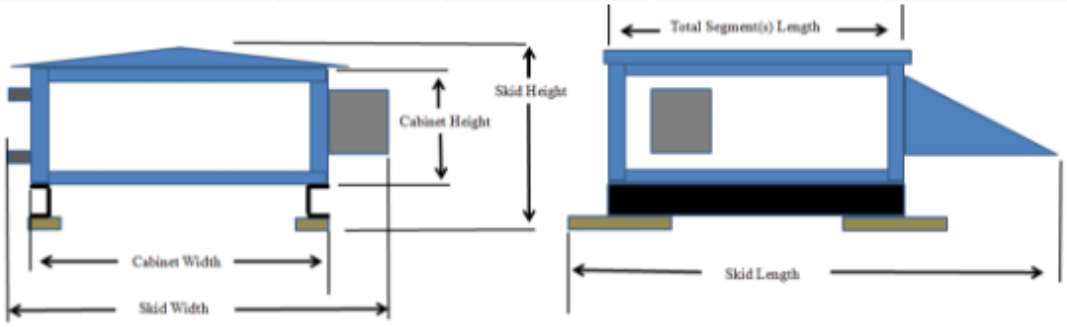
Note: The use of frequency inverters (variable frequency drives) can increase sound levels.

YORK®

YORK® Custom Air Handling Unit Performance Report R1

Shipping Summary

Details				
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Skid Weight (lbs.)
SKID 1	52	76	108	1,879
SKID 2	127	76	108	5,126
SKID 3	118	76	126	4,676
SKID 4	107	76	120	3,757



Notes

Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).

Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping woodblocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).

Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping woodblocks, front dampers, split connectors, electrical/control components, outrigging extensions, isolation dampers, inlet baskets).

Sound Summary

Unit Sound Power Levels (dBs re 1.0 pico-Watts)								
Opening	63	125	250	500	1000	2000	4000	8000
Discharge	86	88	92	97	87	82	76	69
Outside	81	81	90	93	73	67	60	52
Casing Radiated	81	77	81	81	75	59	51	45

Notes

Sound data is determined from AMCA-311 certified fan sound power or fan manufacturers' published sound power. Sound data derived using this method are provided for sound comparisons to non-AHRI Standard 260 products. For York Custom project specific units that are to be factory tested, please contact the Application Team for a special quote and applicable test procedure and data.

1. The overall A-weighted sound power level is only applicable to outside and exhaust air openings and casing radiated sound components. This metric does not apply to ducted components.
2. Where applicable, outside air sound power is calculated using 15% of unit airflow.
3. AHU manufacturer makes no claims regarding room NC levels, Acoustic analysis to determine compliance with scheduled or specified NC levels is by others.
4. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to the unit sound power levels.

Project Name: Commonwealth Fusion
Unit Folder: AHU-1_BID
Unit Tag(s): AHU-1

Johnson Controls

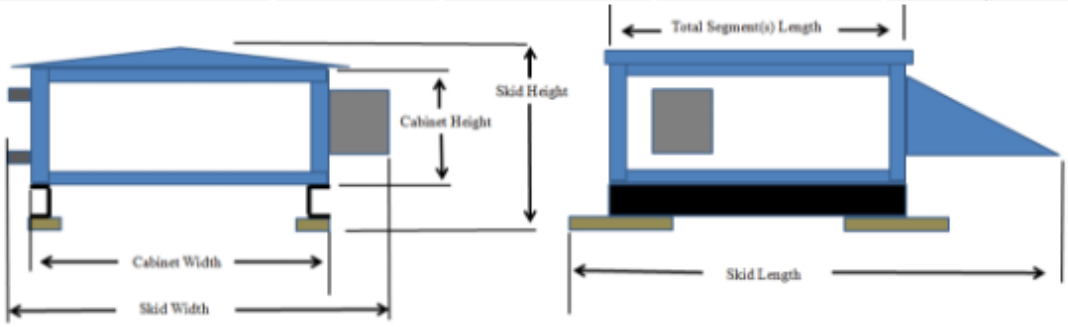
Last Saved: 10/3/2022 11:15:16AM
Report Version: 2022.1.4.743
Software Version: 21.4.6395.9682

YORK®

YORK® Custom Air Handling Unit Performance Report R1

Shipping Summary

Details				
Skid	Skid Length (in)	Skid Height (in)	Skid Width (in)	Skid Weight (lbs.)
SKID 1	79	84	102	2,304
SKID 2	128	84	138	5,201
SKID 3	111	84	118	4,887
SKID 4	87	84	138	3,698



Notes
Skid Width: Total width of the shipping skid, including any items that may extend beyond the cabinet (this includes any door handles, coil connections, drain connections, lifting lugs, mounted pipe-chases, electrical/control components, tie-down brackets, side dampers).
Skid Height: Total height of the shipping skid, including any items that may extend beyond the cabinet (this includes any base-rails, shipping woodblocks, roof peak, discharge flanges, mounted gas-furnace flue pipes).
Skid Length: Total length of the shipping skid, including any items that may extend beyond the cabinet (this includes any mounted rain-hoods, discharge flanges, tie-down brackets, shipping woodblocks, front dampers, split connectors, electrical/control components, outrigging extensions, isolation dampers, inlet baskets).

Sound Summary

Unit Sound Power Levels (dBs re 1.0 pico-Watts)								
Opening	63	125	250	500	1000	2000	4000	8000
Discharge	87	88	93	98	88	82	76	69
Outside	82	82	90	94	73	67	60	52
Casing Radiated	81	78	81	81	75	58	51	45

Notes
Sound data is determined from AMCA-311 certified fan sound power or fan manufacturers' published sound power. Sound data derived using this method are provided for sound comparisons to non-AHRI Standard 260 products. For York Custom project specific units that are to be factory tested, please contact the Application Team for a special quote and applicable test procedure and data.
1. The overall A-weighted sound power level is only applicable to outside and exhaust air openings and casing radiated sound components. This metric does not apply to ducted components.
2. Where applicable, outside air sound power is calculated using 15% of unit airflow.
3. AHU manufacturer makes no claims regarding room NC levels, Acoustic analysis to determine compliance with scheduled or specified NC levels is by others.
4. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to the unit sound power levels.

YORK®

YORK® Custom Air Handling Unit Performance Report R1

Sound Summary

Unit Sound Power Levels (dBs re 1.0 pico-Watts)										
Opening	63	125	250	500	1000	2000	4000	8000		dBA
Supply Air, Right-1	90	91	96	101	90	84	79	73		
Outside Air, EE-1	81	82	92	90	79	76	71	65		89
Outside Air, EE-2	81	82	92	90	79	76	71	65		89
Exhaust Air, EE-1	80	82	93	87	82	79	74	68		89
Exhaust Air, EE-2	80	82	93	87	82	79	74	68		89
Return Air, MB-1	85	88	100	93	83	81	77	71		
Casing Radiated	84	81	86	84	77	61	53	46		84

Notes

Sound data is determined from AMCA 311 certified fan sound power ratings. Unit attenuation is calculated base on measured appurtenance insertion loss, when available, and industry accepted acoustic models.

Notes:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.

2. The overall A-weighted sound power level is applicable to non-dusted openings and casing radiated sound only.

3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

YORK® Custom Air Handling Unit Performance Report R1

Sound Summary

Unit Sound Power Levels (dBs re 1.0 pico-Watts)										
Opening	63	125	250	500	1000	2000	4000	8000		dBA
Supply Air, Bottom-1	96	98	104	98	94	92	89	84		
Outside Air, EE-1	88	92	100	90	86	84	80	75		95
Exhaust Air, EE-1	87	91	96	89	86	84	80	75		93
Return Air, MB-1	88	96	106	91	86	86	82	76		
Casing Radiated	87	86	90	77	79	64	55	48		84

Notes

Sound data is determined from AMCA 311 certified fan sound power ratings. Unit attenuation is calculated base on measured appurtenance insertion loss, when available, and industry accepted acoustic models.

Notes:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.

2. The overall A-weighted sound power level is applicable to non-dusted openings and casing radiated sound only.

3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

YORK®

YORK® Custom Air Handling Unit
Performance Report

Sound Summary

Unit Sound Power Levels (dBs re 1.0 pico-Watts)										
Opening	63	125	250	500	1000	2000	4000	8000		dBA
Supply Air, Bottom-1	87	90	99	92	88	85	80	74		
Outside Air, EE-1	80	83	93	83	72	68	62	54		86
Outside Air, EE-2	80	83	93	83	72	68	62	54		86
Exhaust Air, EE-1	6	6	6	6	6	6	6	6		13
Return Air, MB-1	80	84	93	83	73	69	62	54		
Casing Radiated	81	80	86	74	74	59	49	40		80

Notes

Sound data unavailable. Fan CFM is beyond rated limits at selected RPM.

Notes:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.

2. The overall A-weighted sound power level is applicable to non-duscted openings and casing radiated sound only.

3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

YORK®

YORK® Custom Air Handling Unit Performance Report R0

Sound Summary

Unit Sound Power Levels (dBs re 1.0 pico-Watts)										
Opening	63	125	250	500	1000	2000	4000	8000		dBA
Supply Air, Rear-1	95	98	103	97	94	91	88	83		
Outside Air, EE-1	81	85	91	80	76	73	69	65		85
Outside Air, EE-2	81	85	91	80	76	73	69	65		85
Exhaust Air, EE-1	81	85	89	81	78	75	71	66		85
Exhaust Air, EE-2	81	85	89	81	78	75	71	66		85
Return Air, MB-1	86	94	102	85	82	82	77	71		
Casing Radiated	85	85	89	74	75	61	52	44		82

Notes

Sound data is determined from AMCA 311 certified fan sound power ratings. Unit attenuation is calculated base on measured appurtenance insertion loss, when available, and industry accepted acoustic models.

Notes:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.

2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.

3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

YORK®

YORK® Custom Air Handling Unit Performance Report R1

Sound Summary

Unit Sound Power Levels (dBs re 1.0 pico-Watts)										
Opening	63	125	250	500	1000	2000	4000	8000		dBA
Supply Air, Bottom-1	89	91	101	96	90	86	84	81		
Outside Air, EE-1	83	85	95	87	82	78	73	67		90
Exhaust Air, EE-1	84	87	96	89	86	82	77	70		92
Return Air, MB-1	84	89	98	89	82	80	76	69		
Casing Radiated	79	77	83	73	72	56	46	41		78

Notes

Sound data is determined from AMCA 311 certified fan sound power ratings. Unit attenuation is calculated base on measured appurtenance insertion loss, when available, and industry accepted acoustic models.

Notes:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.

2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.

3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

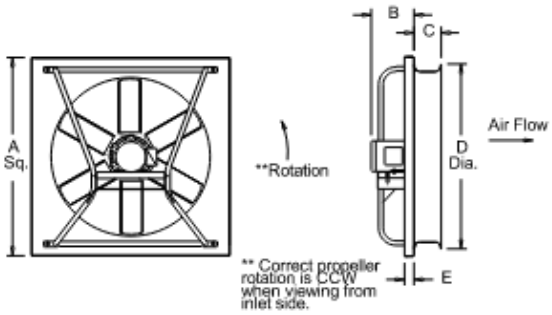
COOK

MARK: FAN-00001
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...
DATE: 10/20/2023

EWD

Wall Exhaust Fan
Extruded Aluminum Propeller
Direct Drive

STANDARD CONSTRUCTION FEATURES:
Extruded aluminum propeller - Propeller hub keyed to shaft - Propellers are statically and dynamically balanced - 14 gauge steel venturi - Welded wall base corners - Aluminum supply inlet - Heavy duty steel power assembly - Lorenized powder paint finish - Corrosion resistant fasteners.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	Speed Ctrl/Hz
1	24EW412D11	2280	.250	1050	.194	n/a(<1HP)	VFD/55

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	VFD Rated
1/2	1140	460/3/60	TEFC -SE	1.1	Yes

FLA based on NEC (2017) Table 430.250

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
82	78	72	71	70	70	67	66	76	65	15.1

- Distance from Sound source 5 ft

Dimensions (inches)

A Sq.	36-3/16
B	14-5/8
C	6-5/8
D Dia.	27-3/8
E	3
Wall Opening*	36-7/16

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	347	Unit	244

* See wire guard or wall collar submittal for accessory wall opening.
***Includes fan, motor & accessories.

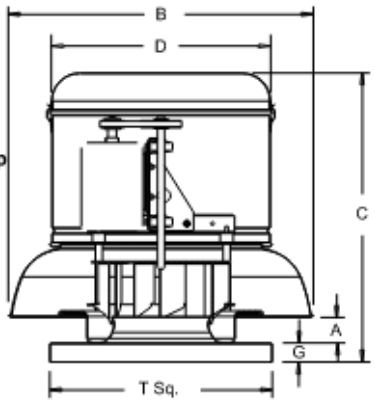
COOK

MARK: FAN-00002	
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...	
DATE: 10/20/2023	

ACE-B

Downblast Centrifugal
Exhaust Ventilator
Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:
All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.



Performance (*Bhp includes 18% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	70C2B	265	.250	1486	.128	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
1/6	1725	115/1/60	ODP -SE	4.4	Yes

FLA based on NEC (2017) Table 430.248

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
79	74	76	63	59	54	50	46	70	58	9.4

- Distance from Sound source 5 ft

Dimensions (inches)

A	2-7/8
B	23-9/16
C	21-1/8
D	16-11/16
G	2
T Sq.	18
Roof Open.Sq.*	13-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	51	Unit	43

*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

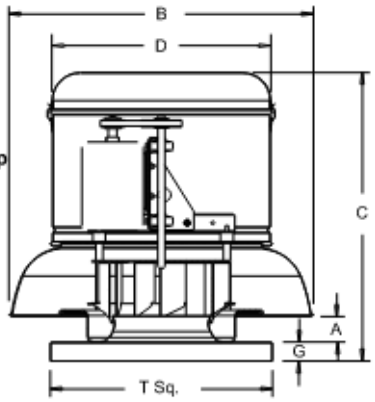
COOK

MARK: FAN-00003	
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...	
DATE: 10/20/2023	

ACE-B

Downblast Centrifugal
Exhaust Ventilator
Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:
All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM -Transit tested packaging - Standard motors ship factory installed.



Performance (*Bhp includes 18% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	100C2B	600	.350	1369	.089	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
1/6	1725	115/1/60	ODP -SE	4.4	Yes

FLA based on NEC (2017) Table 430.248

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
65	67	72	64	59	55	50	46	67	55	7.5

- Distance from Sound source 5 ft

Dimensions (inches)

A	2-7/8
B	23-9/16
C	21-1/8
D	16-11/16
G	2
T Sq.	18
Roof Open.Sq.*	13-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	51	Unit	43

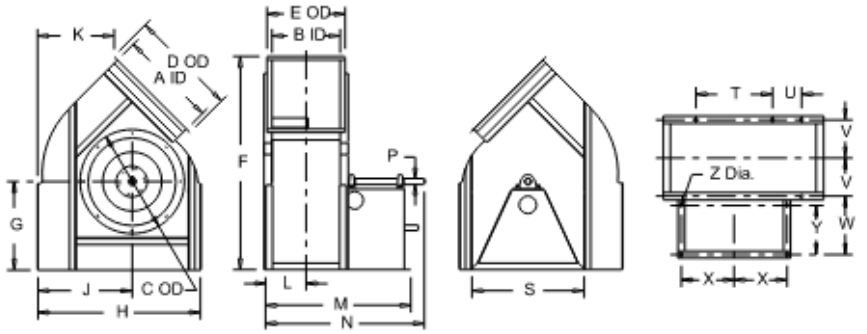
*Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

COOK

MARK: FAN-00005A	
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...	
DATE: 10/20/2023	

CA SWSI

Airfoil Centrifugal Blower
Counterclockwise Top Angular Up
Arrangement 1



Performance (*Bhp includes 3% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	730CA-SWSI	80000	8.00	665	138	85	1.27

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Position	VFD Rated
200	1140	460/3/60	TEFC -PE	240	Y	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
II	2587	CCW	Top Ang. Up	3:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	102	105	94	90	87	85	82	79	95	83
Outlet	105	105	98	94	90	87	84	81	97	85

- Distance from Sound source 5 ft

Dimensions (inches)

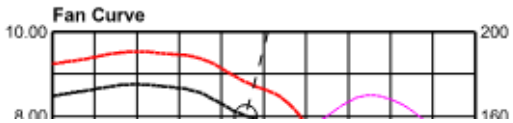
A	79-7/8	L	30-7/8	Y	35-3/4
B	55-3/4	M	99-11/16	Z	1-1/16
C	79	N	107-11/16		
D	84-1/4	P	3-15/16		
E	60-1/8	S	82-1/2		
F	174-3/8	T	77		
G	72	U	33-1/2		
H	131	V	29-5/8		
J	76	W	38-3/16		
K	62-15/16	X	40-1/4		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	9654	Unit	9597

***Includes fan, motor & accessories.

Fan Curve

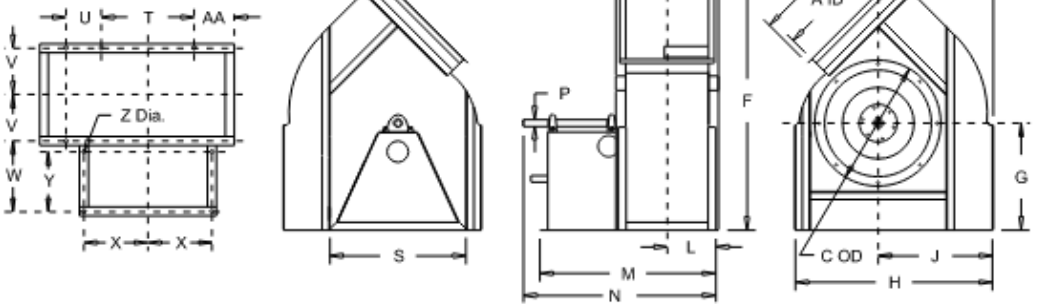


COOK

MARK: FAN-00005B	
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...	
DATE: 10/20/2023	

CA SWSI

Airfoil Centrifugal Blower
Clockwise Top Angular Up
Arrangement 1



Performance (*Bhp includes 3% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG	FEI
1	730CA-SWSI	80000	8.00	665	138	85	1.27

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Position	VFD Rated
200	1140	460/3/60	TEFC -PE	240	X	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
II	2587	CW	Top Ang. Up	9:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	102	105	94	90	87	85	82	79	95	83
Outlet	105	105	98	94	90	87	84	81	97	85

- Distance from Sound source 5 ft

Dimensions (inches)

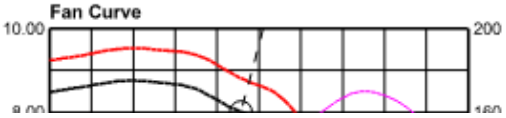
A	79-7/8	L	30-7/8	Y	35-3/4
B	55-3/4	M	99-11/16	Z	1-1/16
C	79	N	107-11/16	AA	16-1/2
D	84-1/4	P	3-15/16		
E	60-1/8	S	82-1/2		
F	174-3/8	T	77		
G	72	U	33-1/2		
H	131	V	29-5/8		
J	76	W	38-3/16		
K	62-15/16	X	40-1/4		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	9654	Unit	9597

***Includes fan, motor & accessories.

Fan Curve



CAVANAUGHTOCCI

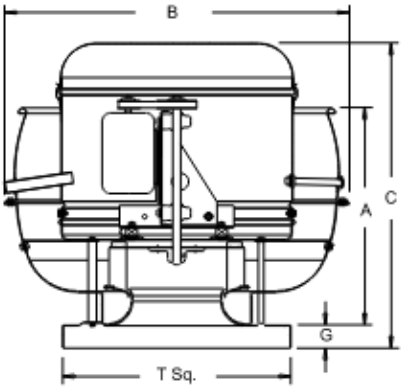
COOK

MARK:	FAN-00006,00008
PROJECT:	COMMONWEALTH FUSION SYSTEMS CAMP...
DATE:	10/20/2023

ACRU-B

Upblast Centrifugal
Exhaust Ventilator
Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:
All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - One piece bottom spinning - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM - Transit tested packaging. Standard motors ship factory installed.



Performance (*Bhp includes 17% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
2	100R OR60	200	.500	1772	.152	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
1/6	1725	115/1/60	ODP -SE	4.4	Yes

FLA based on NEC (2017) Table 430.248

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
74	79	79	70	60	56	51	45	73	62	11.0

- Distance from Sound source 5 ft

Dimensions (inches)

A	14-1/2
B	25-3/16
C	22-7/16
G	2
T Sq.	18
Roof Open. Sq.*	13-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	50	Unit	40

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

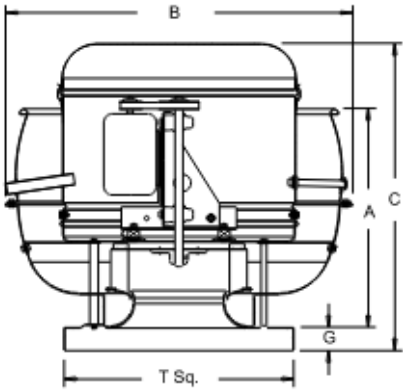
COOK

MARK: FAN-00007	
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...	
DATE: 10/20/2023	

ACRU-B

Upblast Centrifugal
Exhaust Ventilator
Roof Mounted/Belt Drive

STANDARD CONSTRUCTION FEATURES:
All aluminum housing - Backward inclined all aluminum wheel - Two piece top cap with stainless steel quick release latches - One piece bottom spinning - Welded curb cap corners - Birdscreen - Vibration isolators - Lifting Lugs - Permanently lubricated ball bearing motors - Oil and heat resistant, static conducting belts - Adjustable pitch drives through 5 hp motor - Corrosion resistant fasteners - Regreasable bearings in a cast iron pillow block housing, rated at 200,000 hours average life - All fans factory adjusted to specified fan RPM - Transit tested packaging. Standard motors ship factory installed.



Performance (*Bhp includes 18% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	100R OR60	100	.500	1408	.070	n/a(<1HP)

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted
1/6	1725	115/1/60	ODP -SE	4.4	Yes

FLA based on NEC (2017) Table 430.248

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
74	77	77	63	54	51	44	37	70	59	9.0

- Distance from Sound source 5 ft

Dimensions (inches)

A	14-1/2
B	25-3/16
C	22-7/16
G	2
T Sq.	18
Roof Open. Sq.*	13-1/2

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	50	Unit	40

* Roof opening size for curbs supplied by Cook only.
***Includes fan, motor & accessories.

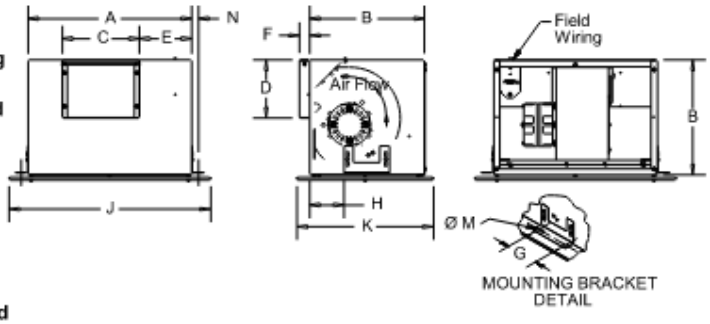
COOK

MARK: FAN-00009	
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...	
DATE: 10/20/2023	

GEMINI

Ceiling and Wall Blowers
200-700 Series

STANDARD CONSTRUCTION FEATURES:
Forward curved galvanized steel fan wheel - Corrosion resistant galvanized steel fan housing - Acoustically insulated housing - Aluminum backdraft damper with solid aluminum hinge rod mounted in nylon bushings - Permanently lubricated motor with built-in thermal overload protection and disconnect plug - Interchangeable panels with removable fasteners allows the discharge to be easily changed - Internal wiring box with disconnect receptacle - Powder-painted white steel grille - Plastic grille standard on sizes 222, 242, 322, and 342.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Nominal RPM	Input Watts	Speed Control
1	GC-322	160	.300	1479	48	FSC

Altitude (ft): 16 Temperature (F): 70

Motor Information

Volts/Ph/Hz	Nameplate Amps
115/1/60	.53

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
54	64	64	51	43	37	34	30	57	45	3.0

- Distance from Sound source 5 ft

Dimensions (inches)

A	12-3/8
B	10-3/4
C	8
D	6
E	2-13/16
F	1
G	4
H	3-9/16
J	15-1/2
K	13-1/4

M	1/2
N	13/16

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	24	Unit	20

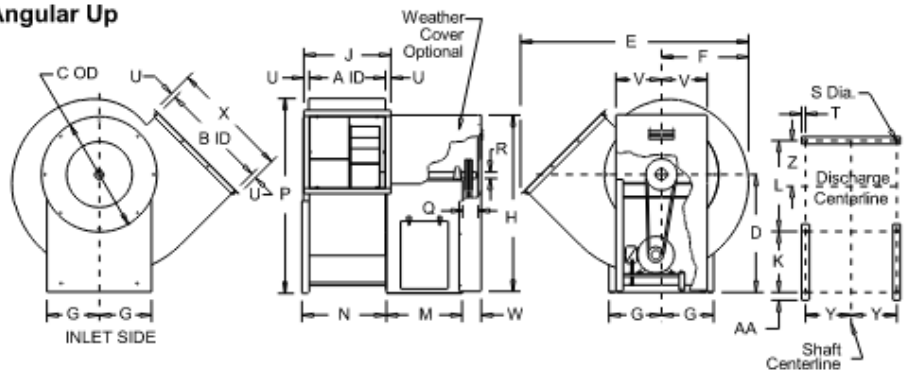
***Includes fan, motor & accessories.

COOK

MARK:	FAN-00010A
PROJECT:	COMMONWEALTH FUSION SYSTEMS CAMP...
DATE:	10/20/2023

CPV

Centrifugal Blower
Clockwise Bottom Angular Up
Arrangement 10



Performance (*Bhp includes 9% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	150 CPV	1900	2.00	1694	1.03	75

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
1-1/2	1725	460/3/60	TEFC -PE	3	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	1455	CW	Bottom Ang. Up	3:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	80	82	81	75	69	69	67	60	78	67
Outlet	91	85	84	77	74	72	66	60	80	69

- Distance from Sound source 5 ft

Dimensions (inches)

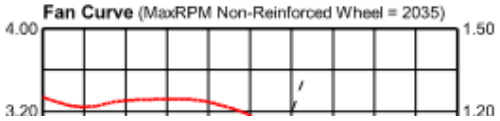
A	11-7/16	L	14-1/8	W	4
B	16-7/16	M	15-1/8	X	19-5/8
C	19-5/8	N	13-1/4	Y	8-5/8
D	19-1/16	P	31-1/16	Z	6-9/16
E	36-13/16	Q	3	AA	1-1/2
F	13-5/16	R	3/4		
G	9-3/8	S	9/16		
H	29-1/16	T	3/4		
J	14-5/8	U	1-5/8		
K	12	V	9		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	346	Unit	237

***Includes fan, motor & accessories.

Fan Curve (MaxRPM Non-Reinforced Wheel = 2035)



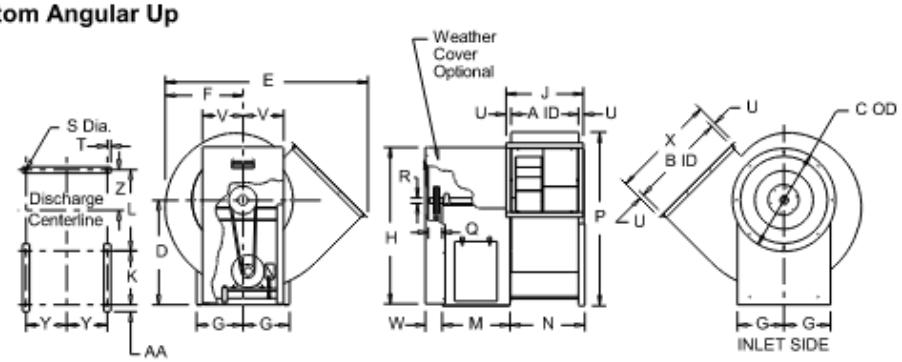
CAVANAUGHTOCCI

COOK

MARK:	FAN-00010B
PROJECT:	COMMONWEALTH FUSION SYSTEMS CAMP...
DATE:	10/20/2023

CPV

Centrifugal Blower
Counterclockwise Bottom Angular Up
Arrangement 10



Performance (*Bhp includes 9% drive loss)

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power* (HP)	FEG
1	150 CPV	1900	2.00	1694	1.03	75

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	FLA	Mounted	VFD Rated
1-1/2	1725	460/3/60	TEFC -PE	3	Yes	Yes

NEMA Premium® efficiency motor per MG-1 (2014) Table 12-12
FLA based on NEC (2017) Table 430.250

Fan Information

Class	OVel(fpm)	Rotation	Discharge	Access
I	1455	CCW	Bottom Ang. Up	9:00

Sound Data Sound Power by Octave Band

	1	2	3	4	5	6	7	8	LwA	dBA
Inlet	80	82	81	75	69	69	67	60	78	67
Outlet	91	85	84	77	74	72	66	60	80	69

- Distance from Sound source 5 ft

Dimensions (inches)

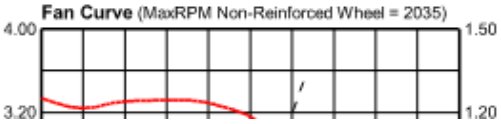
A	11-7/16	L	14-1/8	W	4
B	16-7/16	M	15-1/8	X	19-5/8
C	19-5/8	N	13-1/4	Y	8-5/8
D	19-1/16	P	31-1/16	Z	6-9/16
E	36-13/16	Q	3	AA	1-1/2
F	13-5/16	R	3/4		
G	9-3/8	S	9/16		
H	29-1/16	T	3/4		
J	14-5/8	U	1-5/8		
K	12	V	9		

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	346	Unit	237

***Includes fan, motor & accessories.

Fan Curve (MaxRPM Non-Reinforced Wheel = 2035)



CAVANAUGHTOCCI

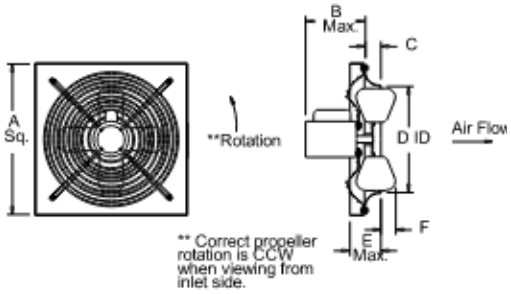
COOK

MARK: FAN-00011	
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...	
DATE: 10/20/2023	

XWD VF

Propeller Wall Fan
Direct Drive
Electronically Commutated Vari-Flow® Motor

STANDARD CONSTRUCTION FEATURES:
Aluminum propeller blades attached to a steel hub - Propellers are statically and dynamically balanced - Spun steel venturi - Welded wall base corners - Lorenized powder paint finish - Plated steel motor mount/wire guard - Corrosion resistant fasteners - Single phase motor.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Power (HP)	FEG	Speed Control
1	16XW28D17 (VF)	1000	.200	953	.087	n/a(<1HP)	EC

Altitude (ft): 20 Temperature (F): 70

Motor Information

HP	RPM*	Volts/Ph/Hz	Enclosure	RLA
1/6	1725	115/1/60	OPEN -EC	2.4

Vari-Flow

*Motor programmed to max speed of 1165 RPM.
RLA based on motor manufacturer's data at programmed HP and max RPM.
Motor is electronically/thermally protected.

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
78	75	70	66	62	58	52	44	68	57	8.4

- Distance from Sound source 5 ft

Dimensions (inches)

A Sq.	20-3/16
B Max.	5-13/16
C	2-1/2
D Dia.	16-3/4
E	4-1/2
F	2
Wall Opening*	20-7/16

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	91	Unit	83

*See wire guard or wall collar submittal for accessory wall opening
***Includes fan, motor & accessories.

CFS-2 FAN-00012, FAN-00014

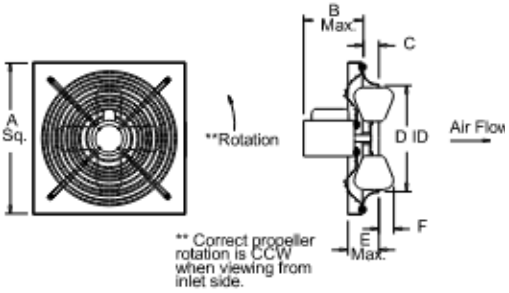
COOK

MARK: FAN-00012, 00014	
PROJECT: COMMONWEALTH FUSION SYSTEMS CAMP...	
DATE: 10/20/2023	

XWD

Propeller Wall Fan
Direct Drive

STANDARD CONSTRUCTION FEATURES:
Aluminum propeller blades attached to a steel hub - Propellers are statically and dynamically balanced - Spun steel venturi - Welded wall base corners - Lorenized powder paint finish - Plated steel motor mount/wire guard - Corrosion resistant fasteners - Single phase motor.



Performance

Qty	Catalog Number	Flow (CFM)	SP (inwc)	Fan RPM	Input Watts	FEG	Speed Control
2	16XW21D132	1000	.250	1050	222	n/a(<1HP)	FSC

Altitude (ft): 16 Temperature (F): 70

Motor Information

HP	RPM	Volts/Ph/Hz	Enclosure	TOL
1/4	1300	115/1/60	ODP -SE	Yes

Sound Data Inlet Sound Power by Octave Band

1	2	3	4	5	6	7	8	LwA	dBA	Sones
72	74	72	71	67	63	57	49	72	61	10.0

- Distance from Sound source 5 ft

Dimensions (inches)

A Sq.	20-3/16
B Max.	5-13/16
C	2-1/2
D Dia.	16-3/4
E	4-1/2
F	2
Wall Opening*	20-7/16

NOTE: Accessories may affect dimensions shown.

Weight(lbs)***	Shipping	75	Unit	67

*See wire guard or wall collar submittal for accessory wall opening
***Includes fan, motor & accessories.

CFS-3 Exhaust fans EF-1 (4 units), EF-2 (4), EF-4(7), EF-5 (2)

Mark Name	Unit Name	Manufacturer	Airflow (CFM)	Motor (HP)	Fan Speed (RPM)	OB1	OB2	OB3	OB4	OB5	OB6	OB7	OB8	LwA	dBA	Sones
EF-1	270 CPS	COOK	7500	7.5	949	78 / 80	81 / 86	80 / 86	74 / 79	71 / 75	68 / 70	64 / 66	60 / 62	77 / 82	66 / 71	– / –
EF-2	120 CPS	COOK	1000	1	2231	70 / 82	77 / 81	80 / 82	77 / 78	69 / 71	65 / 67	64 / 63	60 / 58	77 / 79	66 / 67	– / –
EF-4	365 ACEB	COOK	10000	2	450	83 / –	83 / –	77 / –	70 / –	69 / –	63 / –	54 / –	49 / –	74 / –	63 / –	13 / –
EF-5	150C08D	COOK	988	0.5	860	65 / –	68 / –	64 / –	58 / –	58 / –	52 / –	48 / –	44 / –	62 / –	51 / –	6 / –

CFS-3 Exhaust fans EF-3 (11 units), EF-6 (4)

Mark Name	Unit Name	Manufacturer	Airflow (CFM)	Motor (HP)	Fan Speed (RPM)	OB1	OB2	OB3	OB4	OB5	OB6	OB7	OB8	LwA	dBA	Sones
EF-6	600QMX	COOK	50000	15	355	83 / 86	80 / 87	80 / 84	77 / 81	72 / 75	66 / 69	59 / 61	52 / 53	78 / 82	66 / 70	– / –
EF-3	70CPS	COOK	500	0.75	2818	78 / 95	90 / 98	88 / 91	82 / 89	78 / 83	69 / 78	65 / 71	58 / 61	84 / 90	73 / 78	– / –

CFS-3 ERV (2 units)

PACE Air Handling Unit
Performance Report

Sound Summary

Unit Sound Power Levels (dBs re 1.0 pico-Watts)										
Opening	63	125	250	500	1000	2000	4000	8000		dBA
Supply - Supply Air,Rear-1	82	88	98	91	88	86	82	81		
Supply - Outside Air, MB-1	68	69	66	58	59	58	55	52		65
Return - Exhaust Air,Rear-1	78	79	83	72	73	73	73	72		81
Return - Return Air, MB-1	73	79	83	79	76	73	70	67		
Casing Radiated	74	77	82	71	72	58	52	47		77

Notes

Sound data is determined from interpolation of AHU test data in accordance with the latest version of AHRI 260 Sound Rating of Ducted Air Moving and Conditioning Equipment.

Notes:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.

2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.

3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

4. Economizer sound components are calculated using 100% outside air

5. Filter insertion loss not included due to unknown media type or media by others

CFS-3 MAU (11 units)

PACE™

Air Handling Unit Performance Report

Dimensions and Weight

Details					
Segment	Description	Length[1] (in)	Height (in)	Width[2] (in)	Weight[3] (lbs)
MB	Mixing Box	24	84	102	1,141
AT	Attenuator	26	84	102	1,070
XA-1	Access	22	84	102	373
RF	Rigid Filter	18	84	102	574
HC	Heating Coil	10	84	102	936
XA-2	Access	26	84	102	434
CC	Cooling Coil	32	84	102	1,610
FS	Fan (Supply)	70	84	102	2,703
Overall		228			

Notes

[1]The length includes bottom tier segments only.

[2]The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

[3]See Shipping Summary for notes on weights.

Report and Sound Summary:

Unit Sound Power Levels (dBs re 10^{-12} Watts)									
Opening	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Supply Air, Rear, FS-1	81	87	99	93	90	87	86	82	
Outside Air, MB-1	73	72	69	62	59	59	55	47	67
Casing Radiated	71	73	79	69	70	56	51	45	74

Notes

Sound data is determined from interpolation of AHU test data in accordance with the latest version of AHRI Standard 260 Sound Rating of Ducted Air Moving and Conditioning Equipment.. Unit attenuation is calculated based on measured appurtenance insertion loss, and industry accepted acoustic models.

NOTES:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.
2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.
3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

CFS-3 ASHP (3) – data is for a 4-cell configuration; each unit is equivalent to two 4-cell sections

QUANTECH

Performance Report

Performance Specification

Project Name: | Unit Tag: **CH-1** | Qty.: **1** | Model: **QTH10140**

Combined units or modular chiller array rating is outside of the scope of the AHRI Air-Cooled Water-Chilling Packages Certification Program. Individual unit ratings are subject to the governing documents of the AHRI Certification Program. Auxiliary components included in total KW - Oil heaters, Chiller controls. Auxiliary power is already included in the compressor and fan power

AHRI CERTIFIED® www.ahridirectory.org
Air-Cooled Water Chilling Packages
AHRI Standards 550/590 and 551/591

Part Load Performance (Based on Multi-Step Unloading w/ User Specified % Load & Ambient Temp)

Percent Load	Ambient [°F]	Capacity [tons.R]	Power Input [kW]	Unit Efficiency [Btu/W.h]
100.0	91.0	124.1	134.8	11.04

Sound Power Levels (In Accordance with AHRI 370)

Percent Load	Ambient [°F]	Octave Band Center Frequency [Hz]								LWA
		63	125	250	500	1000	2000	4000	8000	
100.0	91.0	85.0	86.0	85.0	84.0	78.0	75.0	73.0	70.0	85.0

Note:Unit is equipped with Acoustic Enclosure And Silent Mode (Optional) and High Efficiency Fans with Variable Speed EC motor.

Measurement of sound pressure used to obtain the sound power data presented is based on AHRI-370.

Air-cooled chillers are rated in terms of sound power not sound pressure. Johnson Controls provides estimates of sound pressure, but this is not the rating metric.

For an air-cooled chiller, sound pressure calculated from sound power varies depending on how the chiller is assumed to behave, i.e. the radiation model. In other words, determining sound pressure from sound power requires making assumptions that result in different answers at a given distance from the chiller. The environment also influences sound pressure in the field installation. Sound pressure estimation radiation models pertaining to air-cooled chillers include the 'traditional' hemispherical model, parallelepiped model and equivalent hemispherical model.

Regarding sound power, Johnson Controls references tolerance limits based on ASHRAE guidelines. These are +/- 6dB in the 63Hz octave band, +/- 4dB in all other octave bands and +/- 3dB for the overall dBA.

Tolerance limits are based on uncertainties associated with:

1. Measurement Test Procedure

2. Repeatability

3. Production / Manufacturing Variability

Standard deviation associated with air-cooled chiller sound data is a measure of spread i.e. it indicates the range of probability of sound levels. Note that for operating conditions other than AHRI's Standard Rating Condition, higher levels of uncertainty can be expected.

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Bertrams since 1894

TECHNICAL SPECIFICATION

Thermal data

Design heater capacity	total 63 MW in 3 x 21 MW heaters
Net plant efficiency at full load	> 90% (design 91% at 21 MW load)
FliBe fluid at heater inlet / outlet design	525°C / 625°C
FliBe fluid at heater inlet / outlet turndown	545°C / 625°C
FliBe fluid flow @ 575°C, per heater design	158.5 m³/h (316'848 kg/h, 88 kg/s) per heater
FliBe fluid flow @ 585°C, per heater turndown	198.6 m³/h (396'060 kg/h, 110 kg/s) per heater

Site conditions

Location and country of erection	Devens, Massachusetts, USA
Site of erection (FliBe heater package)	indoor service, protected against weather influences
Site of erection (control panel)	indoor, control room air-conditioned.
Installation altitude	< 100 m above sea level

Climatic conditions (to be confirmed)

Temperature min. / max.	15°C / +30°C (design 25°C)
Atmosphere	maritime atmosphere
Atmospheric pressure	1.015 bar
Relative humidity	76.5% @28.2°C dry bulb = 24.9 wet bulb

Wind (to be confirmed)

Direction	Variable, but mainly from southeast
ASCE 7-10 Windspeed (3 sec peak gust in mph)	Design wind speed: 138 mph (to be confirmed) Current design speed considered: 35 m/s (78 mph) Mean RI 10 year: 76 mph MRI 100 year: 109 mph

Rainfall (to be confirmed)

Max. rainfall	85 mm (app. 1 hour, 10-year storm)
Design rainfall	200 mm (app. 3hour, 50-year storm)
Annual average	1500 mm/year

Noise limitation

Combined noise sound pressure level (SPL) of equipment, machinery and their electric motors shall be limited to 85 dB (A) @ 1 m according to DIN 45635. Noise levels (SPL) shall be 85 dB (A) @ 1m from every equipment, apparatus, ducts etc. At stack outlet 68 dB(A) @ 1 m according to DIN 45635.

CFS-4 process cooler fans (data is for one fan; project uses two unit of three fans each)

Moore Fans LLC Rating

Phone: (660) 376-3575 http://www.moorefans.com **Fax:(660) 376-2909**

Version 2.45

8/26/2025 20:42

		Ref No.:		**Item No.:**	
Class:	**10000**	Hub Type:	**HD**	Blade Type:	**MAG-9**
Blade Tip:	**AM**	Adjustment:	**MAN**	Rotation:	**RH**
Series:	**48**	Diameter:	**12** feet	Blades:	**5**
Temperature:	**100** Deg. F	Elevation:	**500** feet	Density Ratio:	**0.928** 0%
Volume:	**157993** ACFM	Air Vel.:	**1527.53** fpm	Speed:	**146.0** RPM
Static Pressure:	**0.309** in H2O	Pv:	**0.135** in H2O	Pt:	**0.484** in H2O
Power Reqd.:	**16.07** bhp	Motor:	**25** bhp	Total Eff:	**75.0%**
Power @ 25 deg.	**18.56** bhp	Bld Natural Freq.:	**4.1**	Static Eff:	**47.9%**
Blades Required:	**4.04**	API Blades Req.:	**5**	Blade Load:	**0.808**
Tip Speed:	**5504.1** fpm			Pitch Number:	**2.62**
Entry Correction:	**1.3**	Tip Clearance:	**0.36** inches	Angle at Root:	**22.3** deg
Exit Correction:	**Not Applied**	Draft:	**Forced**	Orientation:	**Horizontal**
Torque Factor:	**2**	Motor Torque:	**1799** ft. lbs	Torq/Bld:	**360** ft. lbs
Approx. weight.:468 lbs (213 kgs)		Inertia: 5507 lb-ft2 (232.5 kg-m2)		Bore Size:	inches
Unbalance force (G6.3): 4.6 lbs (20.5 N)		Thrust load: 284 lbs (129 kg)		Bushing Type:	**W**
		Hub Extension: Standard		Qty required:	**1**

Sound Levels Per Fan (Forced Draft) (Horizontal Orientation) See Note 2

Sound Power Level

dBA	HZ 63	125	250	500	1000	2000	4000	8000
82.4	**79.9**	**83.4**	**81.2**	**78.5**	**76.8**	**74.8**	**71.9**	**69.9**

Sound Pressure Level 1 meter below fan

68.3	**65.8**	**69.3**	**67.1**	**64.4**	**62.7**	**60.7**	**57.8**	**55.8**

Sound Pressure Level 1 meter radially from blade tip

63.3	**60.8**	**64.3**	**62.1**	**59.4**	**57.7**	**55.7**	**52.8**	**50.8**

Estimated Sound Pressure Level Multiple Fans (6 fans at 400 ft from periphery)

40.0	**37.5**	**41.0**	**38.8**	**36.1**	**34.4**	**32.4**	**29.5**	**27.5**

Class 10000, Series 48, 12 feet Diameter, 5 Blades
Manual Adjustment, Heavy Duty, MAG, CW Rotation Aluminum Blade Material
With AM Blade Tips,
Fan Model No. 1048/M24-W0-A/48R-AM-9-12.00-5

Note 1: Maximum blade angle to prevent fan stall is 28.0 degrees.
Available motor power may limit maximum angle to a lower value.

Note 2: Sound levels are the best estimate of the fan sound with 0 dBA additional sound included due to drive components, flow obstructions or structure reflection and reverberation.

YORK®

Air Handling Unit Performance Report

Report and Sound Summary:

Unit Sound Power Levels (dBs re 10^{-12} Watts)									
Opening	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Supply Air,Rear-1	85	91	101	94	91	89	86	83	
Outside Air, MB-1	72	74	73	65	64	60	51	43	69
Casing Radiated	75	78	84	72	74	59	53	48	78

Notes

Sound data is determined from interpolation of AHU test data in accordance with the latest version of AHRI Standard 260 Sound Rating of Ducted Air Moving and Conditioning Equipment.. Unit attenuation is calculated based on measured appurtenance insertion loss, and industry accepted acoustic models.

NOTES:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.
2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.
3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

YORK®

Air Handling Unit Performance Report

Sound Attenuator(s)

Details										
Segment	Quantity	Model	Length (in)	Height (in)	Width (in)	Area (ft^2)	Media	Material	Frequency Range	Face Velocity (ft/ min)
AT	1	YHPS-48-34-20-G9-N-N-N YHPS-24-34-20-G9-N-N-N	20	68	72	34.0	Packless	Galvanized Steel	Normal	441

Dynamic Insertion Loss (dB)								
Segment	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
AT	-3	-4	-12	-12	-8	-7	-7	-7

CFS-4 AHU-3

YORK®

Air Handling Unit Performance Report

Dimensions and Weight

Details					
Segment	Description	Length[1] (in)	Height (in)	Width[2] (in)	Weight[3] (lbs)
MB	Mixing Box	27	63	69	705
RF	Rigid Filter	18	63	69	360
AT	Attenuator	26	63	69	635
XA	Access	24	63	69	315
CC	Cooling Coil	41	63	69	1,225
FS	Fan (Supply)	62	63	69	1,427
EH	Electric Heat	36	63	69	1,542
DP	Discharge Plenum	27	63	69	582
	Overall	261			

Notes

[1]The length includes bottom tier segments only.

[2]The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

[3]See Shipping Summary for notes on weights.

Report and Sound Summary:

Unit Sound Power Levels (dBs re 10^{-12} Watts)									
Opening	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Supply Air,Rear-1	82	86	94	90	89	86	82	83	
Outside Air, MB-1	74	76	73	67	64	59	51	49	70
Casing Radiated	74	75	77	70	73	58	51	49	75

Notes

Sound data is determined from interpolation of AHU test data in accordance with the latest version of AHRI Standard 260 Sound Rating of Ducted Air Moving and Conditioning Equipment.. Unit attenuation is calculated based on measured appurtenance insertion loss, and industry accepted acoustic models.

NOTES:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.
2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.
3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

YORK®

Air Handling Unit Performance Report

Sound Attenuator(s)

Details										
Segment	Quantity	Model	Length (in)	Height (in)	Width (in)	Area (ft^2)	Media	Material	Frequency Range	Face Velocity (ft/ min)
AT	1	YHPS-48-26-20-G9-N-N-N	20	52	48	17.3	Packless	Galvanized Steel	Normal	404

Dynamic Insertion Loss (dB)								
Segment	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
AT	-3	-4	-12	-12	-8	-7	-7	-7

CFS-4 EAHU-1 & EAHU-2

YORK®

Air Handling Unit Performance Report

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (ft²)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
IP	Inlet Air Opening	42.5	15,000	353	0.02	0.00
CC	Cooling - 6 Row - 10 Fins Per Inch	42.5	15,000	353	0.34	0.00
FS	CBD6 (Backdraft Damper With Counterbalance)	3.1	3,750	1,224	0.08	0.00
FS	External Static - User Entered	0.0		0	5.00	0.00
AT	Sound Attenuator	44.8	15,000	335	0.18	0.00
DP	CD60 (Control Damper 60 - Galvanized Airfoil)	26.3	15,000	571	0.01	0.00
DP	Supply Air Opening	28.8	15,000	522	0.05	0.00
				Total	5.68	0.00

Dimensions and Weight

Details					
Segment	Description	Length[1] (in)	Height (in)	Width[2] (in)	Weight[3] (lbs)
IP	Inlet Plenum	6	72	114	507
XA	Access	24	72	114	421
CC	Cooling Coil	38	72	114	1,924
FS	Fan (Supply)	67	72	114	2,181
AT	Attenuator	90	72	114	2,961
DP	Discharge Plenum	27	72	114	1,110
	Overall	252			

Notes

[1]The length includes bottom tier segments only.

[2]The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

[3]See Shipping Summary for notes on weights.

Report and Sound Summary:

Unit Sound Power Levels (dBs re 10^{-12} Watts)									
Opening	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Supply Air,Rear-1	77	76	81	68	63	60	59	62	
Inlet,Front-1	79	85	89	85	82	80	77	74	
Casing Radiated	74	76	82	70	72	57	51	46	77

Notes

Sound data is determined from interpolation of AHU test data in accordance with the latest version of AHRI Standard 260 Sound Rating of Ducted Air Moving and Conditioning Equipment.. Unit attenuation is calculated based on measured appurtenance insertion loss, and industry accepted acoustic models.

NOTES:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.
2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.
3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

Door(s)

Details												
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	ViewPort Wire	Test Port	Spare Gasket	Thermal Break	Fastener Type	Safety Latch	Noncontact Safety Interlock
XA	Left	Outward	Front	66 x 24 x 2	Double Pane - 8x8	-	Yes	-	-	Plated	-	-
CC	Left	Outward	Rear	66 x 24 x 2	Double Pane - 8x8	-	Yes	-	-	Plated	-	-
FS	Left	Outward	Rear	66 x 26 x 2	Double Pane - 8x8	-	Yes	-	-	Plated	Yes	-
DP	Left	Outward	Rear	66 x 24 x 2	Double Pane - 8x8	-	Yes	-	-	Plated	Yes	-

Sound Attenuator(s)

Details										
Segment	Quantity	Model	Length (in)	Height (in)	Width (in)	Area (ft^2)	Media	Material	Frequency Range	Face Velocity (ft/ min)
AT	1	RMB-ULV-F3	84	62	104	44.8	Standard	Galvanized Steel	Low	335

Dynamic Insertion Loss (dB)								
Segment	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
AT	-8	-16	-23	-27	-30	-33	-29	-21

CFS-4 EAHU-3

Face Velocity and Static Pressure

Summary						
Segment	Description	Face Area (ft²)	Airflow (CFM)	Face Velocity (ft/min)	Supply Fan Static Pressure (in w.g.)	Exhaust/Return Fan Static Pressure (in w.g.)
IP	Inlet Air Opening	21.2	7,000	329	0.02	0.00
CC	Cooling - 6 Row - 8 Fins Per Inch	38.3	7,000	183	0.08	0.00
FS	CBD6 (Backdraft Damper With Counterbalance)	1.8	1,750	954	0.04	0.00
FS	External Static - User Entered	0.0		0	5.00	0.00
AT	Sound Attenuator	40.4	7,000	173	0.13	0.00
DP	CD60 (Control Damper 60 - Galvanized Airfoil)	26.2	7,000	267	0.00	0.00
DP	Supply Air Opening	28.8	7,000	243	0.01	0.00
				Total	5.28	0.00

Dimensions and Weight

Details					
Segment	Description	Length[1] (in)	Height (in)	Width[2] (in)	Weight[3] (lbs)
IP	Inlet Plenum	6	66	114	482
XA	Access	24	66	114	407
CC	Cooling Coil	38	66	114	1,621
FS	Fan (Supply)	67	66	114	1,873
AT	Attenuator	66	66	114	2,062
DP	Discharge Plenum	27	66	114	1,073
	Overall	228			

Notes

[1]The length includes bottom tier segments only.

[2]The width does not include coil connection extensions or door latches that extend beyond the unit casing. The width does not include the depth of any pipe chases.

[3]See Shipping Summary for notes on weights.

Report and Sound Summary:

Unit Sound Power Levels (dBs re 10^{-12} Watts)									
Opening	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Supply Air,Rear-1	79	77	77	68	64	61	63	70	
Inlet,Front-1	79	86	91	87	82	79	74	74	
Casing Radiated	74	75	77	70	72	58	51	49	75

Notes

Sound data is determined from interpolation of AHU test data in accordance with the latest version of AHRI Standard 260 Sound Rating of Ducted Air Moving and Conditioning Equipment.. Unit attenuation is calculated based on measured appurtenance insertion loss, and industry accepted acoustic models.

NOTES:

1. AMCA-311 fan sound certification tolerances (+6 dB in the 63 Hz band and +3 dB in all other bands) apply to unit sound power levels.
2. The overall A-weighted sound power level is applicable to non-ducted openings and casing radiated sound only.
3. AHU manufacturer makes no claims regarding NC levels. Acoustic analysis to determine compliance with scheduled or specified NC levels is by others

Door(s)

Details												
Segment(s)	Location	Swing	Hinge Location	H x W x T (in)	View Port	ViewPort Wire	Test Port	Spare Gasket	Thermal Break	Fastener Type	Safety Latch	Noncontact Safety Interlock
XA	Left	Outward	Front	60 x 24 x 2	Double Pane - 8x8	-	Yes	-	-	Plated	-	-
CC	Left	Outward	Rear	60 x 24 x 2	Double Pane - 8x8	-	Yes	-	-	Plated	-	-
FS	Left	Outward	Rear	60 x 26 x 2	Double Pane - 8x8	-	Yes	-	-	Plated	Yes	-
DP	Left	Outward	Rear	60 x 24 x 2	Double Pane - 8x8	-	Yes	-	-	Plated	Yes	-

Sound Attenuator(s)

Details										
Segment	Quantity	Model	Length (in)	Height (in)	Width (in)	Area (ft^2)	Media	Material	Frequency Range	Face Velocity (ft/ min)
AT	1	RMB-ULV-F3	60	56	104	40.4	Standard	Galvanized Steel	Low	173

Dynamic Insertion Loss (dB)								
Segment	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
AT	-6	-12	-22	-26	-30	-31	-24	-17

CFS-4 ACC

YORK®

Performance Report

Performance Specification

Project Name: **Jacobs Project Confidential A** Unit Tag: **CH-1** Qty.: **1** Model: **YMAE0140**

Combined units or modular chiller array rating is outside of the scope of the AHRI Air-Cooled Water-Chilling Packages Certification Program. Individual unit ratings are subject to the governing documents of the AHRI Certification Program. Auxiliary components included in total KW - Oil heaters, Chiller controls. Auxiliary power is already included in the compressor and fan power

AHRI CERTIFIED® www.ahridirectory.org Air-Cooled Water Chilling Packages AHRI Standards 550/590 and 551/591

Part Load Performance (Based on Multi-Step Unloading w/ User Specified % Load & Ambient Temp)				
Percent Load	**Ambient [°F]**	**Capacity [tons.R]**	**Power Input [kW]**	**Unit Efficiency [Btu/W.h]**
100.0	95.0	136.3	163.5	10.00

Sound Power Levels (In Accordance with AHRI 370)										
Percent Load	**Ambient [°F]**	**Octave Band Center Frequency [Hz]**								**LWA**
		63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	
100.0	95.0	88.0	90.0	90.0	88.0	84.0	80.0	76.0	74.0	90.0

Note:Unit is equipped with Acoustic Enclosure Required (Optional) and High Efficiency Fans with Variable Speed EC motor.

Measurement of sound pressure used to obtain the sound power data presented is based on AHRI-370.

Air-cooled chillers are rated in terms of sound power not sound pressure. Johnson Controls provides estimates of sound pressure, but this is not the rating metric.

For an air-cooled chiller, sound pressure calculated from sound power varies depending on how the chiller is assumed to behave, i.e. the radiation model. In other words, determining sound pressure from sound power requires making assumptions that result in different answers at a given distance from the chiller. The environment also influences sound pressure in the field installation. Sound pressure estimation radiation models pertaining to air-cooled chillers include the 'traditional' hemispherical model, parallelepiped model and equivalent hemispherical model.

Unitary IMUSB									
Hz	63	125	250	500	1000	2000	4000	8000	Overall
HUSHCORE	-4	-7	-8	-10	-10	-9	-8	-7	-10
Summit Independent 2I2E									
Hz	63	125	250	500	1000	2000	4000	8000	Overall
HUSHCORE	-6	-6	-10	-12	-12	-13	-8	-8	-11
Summit Independent 2I3E									
Hz	63	125	250	500	1000	2000	4000	8000	Overall
HUSHCORE	-6	-8	-14	-16	-16	-17	-10	-10	-17

- HUSHCORE systems to not exceed pressure drop with system effect of .20"w.g.
- Unitary IMUSB is to be considered a condenser fan noise reduction solution only
- Summit is to be considered a total unit sound power reduction solution
- All systems to be independently supported, BRD engineering to provide all applicable calculations and design details for coordination and integration
- All systems consist of silencers that allow for flexibility in octave band insertion loss, based on feedback we can adjust performance
- System height estimated at 60" - 72". Sumit system width increases to be 24" on each broad side for a total of 48" increase.

CFS-4 RTU-3

Johnson Controls

3-6

Project Name: **CFS Jacobs**

Quantity: **1** Tag #: **RTU-3** **Ton**

Cooling Performance		
Total gross capacity	41.8	MBH
Sensible gross capacity	29.0	MBH
Total net capacity	37.9	MBH
Sensible net capacity	25.1	MBH
Seasonal Efficiency (at ARI)	13.40	SEER2
Efficiency (at ARI)	11.40	EER2
Ambient DB temp.	95.0	°F
Entering DB temp.	79.0	°F
Entering WB temp.	65.0	°F
Evap Coil Leaving DB temp.	56.6	°F
Evap Coil Leaving WB temp.	53.3	°F
Unit Leaving DB temp.	59.6	°F
Unit Leaving WB temp.	54.5	°F
Leaving air temp dew point	50.9	°F
Power input (w/o blower)	2.80	kW
Sound power	76	dB(a)

CFS-4 RTU-4

Johnson Controls

3-6

Project Name: **CFS Jacobs**

Quantity: **1** Tag #: **RTU-4** **Ton**

Cooling Performance		
Total gross capacity	49.3	MBH
Sensible gross capacity	35.4	MBH
Total net capacity	45.2	MBH
Sensible net capacity	31.3	MBH
Seasonal Efficiency (at ARI)	13.40	SEER2
Efficiency (at ARI)	11.20	EER2
Ambient DB temp.	95.0	°F
Entering DB temp.	79.0	°F
Entering WB temp.	65.0	°F
Evap Coil Leaving DB temp.	55.6	°F
Evap Coil Leaving WB temp.	53.1	°F
Unit Leaving DB temp.	58.3	°F
Unit Leaving WB temp.	54.2	°F
Leaving air temp dew point	51.3	°F
Power input (w/o blower)	3.40	kW
Sound power	80	dB(a)