Tacoma

CITY OF TACOMA

Generation/Plant Engineering

ADDENDUM NO. 3 **DATE:** February 9, 2021

REVISIONS TO:
Request for Bids Specification No. PG20-0156F
Administrative Building North Fan Wall

NOTICE TO ALL BIDDERS:

This addendum is issued to clarify, revise, add to or delete from, the original specification documents for the above project. This addendum, as integrated with the original specification documents, shall form the specification documents. The noted revisions shall take precedence over previously issued specification documents and shall become part of this contract.

REVISIONS TO THE GENERAL INFORMATION AND REQUIREMENTS:

- Section 1010, 1.3 Site Showing: Contractors who were unable to attend the Preconstruction virtual meeting can call Jay Madden (253-365-5914) to setup site visit(s) on or before February 16, 2021 at 11:00am.

REVISIONS TO THE TECHNICAL PROVISIONS:

- Section 23 34 00, 2.1, G: Plenum fan Manufactures:
    - Requested Substitution Request for Dynamic Air Technology (Fan Cubes) submitted by Industrial Air Systems, Inc.: Based on the design constraints of the space available, Fan Cube (housed) type fan-walls have an unlikely probability to fit within the allowed space and allow for adequate plenum/filter space at the return side of the fans.
        - Refer to section 01300, 1.4, “Or Equal” Clause or Substitutions.

REVISIONS TO THE PLANS:

- Drawing M-4: **Add** Diamond note (6): Demo existing sheet metal elbow and associated damper. Keep outside air louver.
- Drawing M-4: **Add** Diamond note (7): Demo existing chemical fire suppression piping – By Owner as Required.
- Drawing M-5: **Revise** Flag Note (7) to include; add to note (7) “On north side of elevator shaft shown at gridline (4H) is an existing elevator room access door starting at approximately six (6) foot above finished floor. Contractor shall provide means of accessing this area by modifying the new sheet metal transition and/or with removable sheet metal partitions as needed for clearance and future access.”
- Drawing M-5: **Revise** Flag Note (3): Replace 36x72 door size with 48x96 door. Replace 2x4 sheet metal stud wall with 2x6 sheet metal stud wall with rock wool insulation or contractor option of standing seam-insulated sheet metal, lined with perforated faced metal for acoustical absorbing properties.
- Drawing M-5: **Revise** Flag Note (4): Replace 36x72 door size with double door 48x96 per each door panel (Total opening of 96x96). Relocate Main disconnect Control Panel for fan array and quick connect box east on the same wall to avoid new door size.

- Drawing M-5: Flag Note (14): Demo existing chemical fire suppression piping – By Owner as Required.
- Drawing M-5: **Add** to Flag Note (2): Provide (2) 24x24 duct access doors. Locate one on east side of new ductwork elbow. Locate one on south side of new ductwork elbow.

NOTE: Acknowledge receipt of this addendum by initialing the corresponding space as indicated on the signature page. Vendors who have already submitted their bid/proposal may contact the Purchasing Division at 253-502-8468 and request return of their bid/proposal for acknowledgment and re-submittal. Or, a letter acknowledging receipt of this addendum may be submitted in an envelope marked Request for Bids Specification No. PG20-0156F Addendum No. 3. The City reserves the right to reject any and all bids, including, in certain circumstances, for failure to appropriately acknowledge this addendum.

Patsy Best, Procurement and Payables Manager
Finance/Purchasing Division

Cc: Jay Madden, Generation
Terry Ryan, Assistant Generation Manager

INDUSTRIAL AIR SYSTEMS INC.

17739 15th Ave. N.E. P. 206.367.5115
Shoreline, WA 98155 F. 206.363.0653 www.indair.net

January 18, 2021

Tacoma Power/Generation
3628 South 35th, Street
Tacoma, WA 98409

Project: PG20-0156F Administrative Building North Fan Wall
Subject: Prior Approval – Fan Array as specified per Section 23 34 00, Page 2, Paragraph 2.1

Dear Sir/Mam:

We respectfully request your approval of "Dynamic Air Technology" Fan Array as being equal/ superior to product specified. The "Dynamic Air Technology" Fan Array will be equipped as follows: Per Specifications

- Please see attached

Sincerely,
Industrial Air Systems, Inc.

Scott Pierce

TACOMA POWER / GENERATION
SUBSTITUTION REQUEST FORM

This request shall be submitted to engineer listed below per Specification Submittals and Shop Drawings Section (Construction) or Substitutions Section (Supply). Substitution requests not received by the engineer will not be considered.

TO: Tacoma Power/Generation
3628 South 35th Street
Tacoma WA 98409
Fax: 253-502-8136

ATTN: **Jay Madden** Date: 1/18/2021

PROJECT: **PG20-0156F Administrative Building North Fan Wall** Transmittal No. _____

(Specification/Name/Contract No., if applicable)

We hereby submit for consideration, the following product instead of the specified item for the above project:

Specification Section: 23 34 00, 2.1

Specified Item: Plenum Fans and Fan Array

Proposed Substitution: Dynamic Air Technology

NOTES: Attach complete technical data, including laboratory tests and samples as applicable.

Provide a detailed comparison of the significant qualities (size, weight, durability, performance and similar characteristics, and including visual effect, where applicable) for the proposed substitution in comparison with the original requirements.

List completely, installation changes and changes to drawings and specifications required by the proposal.

FILL IN BLANKS BELOW:

A. Does substitution require change in drawing dimensions? ☐ Yes ☒ No
If yes, provide detail: _____

B. Will undersigned pay for resulting building design changes including engineering/detailing costs? ☒ Yes ☐ No

C. What effect does substitution have on other trades? None

D. Difference between proposed substitution and specified item? Equal/Superior Product

E. Manufacturer's guarantees of proposed and specified items are? ☒ Same ☐ Different*
*Explain differences on attachment(s).

F. Are maintenance/service parts locally (within 50 miles) available for proposed substitution? ☒ Yes ☐ No

G. Will the proposed substitution have any effect on compliance with applicable codes? ☐ Yes ☒ No
If yes, explain: _____

H. Name and address and current phone number the Project Lead for three (3) similar projects where the proposed product was used, along with the Project name and date of installation:

1. Pierce County Skills Center, Bethel Public Schools, Spanaway, Hargis Eng.
2. El Cajon Administration Building, El Cajon California 2018
3. PHI Brookshire MOB, California 2020, see attached projects list

I. Contract completion date is? _____ ☒ Same ☐ Different*
**Explain differences on attachment(s).*

TACOMA POWER / GENERATION
SUBSTITUTION REQUEST FORM

This request shall be submitted to engineer listed below per Specification Submittals and Shop Drawings Section (Construction) or Substitutions Section (Supply). Substitution requests not received by the engineer will not be considered.

Undersigned attests function and quality equivalent or superior to specified item and waives their rights to additional payment and time which may subsequently be necessitated by failure of the substitution to perform adequately, and for the required work to make corrections thereof.

SUBMITTED BY:

Scott Pierce
Name

Industrial Air Systems, Inc
Firm

8602 Maltby Road
Address

Woodinville, WA 98072
City, State, Zip

206-367-5115
Phone No.

Scott Pierce — 1/18/2021
Signature — Date

FOR USE BY TACOMA POWER:

☐ Accepted ☐ Accepted as Noted

☒ Not Accepted ☐ Received Too Late

By: _____
(Project Lead/Manager)

Signature: Madden, Jay
Digitally signed by Madden, Jay
DN: E=JMadden@ci.tacoma.wa.us, CN="Madden, Jay", OU=GEN, OU=Users, OU=POWER, OU=TPU, OU=CDT, DC=Tacoma, DC=lcl
Date: 2021.02.02 14:02:04 -08'00'

Date: 02/02/2021

REMARKS:
See Addendum #3 for comments.

DYNAMIC AIR TECHNOLOGY, INC.
Manufacturers of Custom Air Handling Equipment

SUBMITTAL

09-15-2020

Fan Array

71,000 CFM @ 3.5" TSP

Similar Project Sample Submittal

PROJECT: **PIH BROOKSHIRE MOB**

708 N. Vincent Ave Covina, California 91722 • Phone 626-967-7273 • Fax 626-967-7221

DYNAMIC AIR TECHNOLOGY, INC.

Manufacturers of Custom Air Handling Equipment

PROJECT: PIH BROOKSHIRE MOB

Fan Array – 71,000 CFM @ 3.5" TSP

- Quantity of 12, direct drive ECM fans in cubes.
- Cubes will be constructed from 18 gauge galvanized steel outer panels and 22 gauge perforated inner liner.
- Cubes will have 1" thick, 1.5# density fiberglass insulation.
- Cubes will have 2"x2" brackets with ½" holes to attached cubes to each other.
    - Hardware to attach the cubes to each other will be provided.
    - Anchoring bolts to anchor fan cubes to floor and ceiling by others.
- Electrical panel with non-fused rotary disconnect, circuit breaker, terminal block, and indicator lights on the exterior of the panel.
- Wire / wire whips will be provided for each fan (one for main power and one for 0-10 VDC controls).

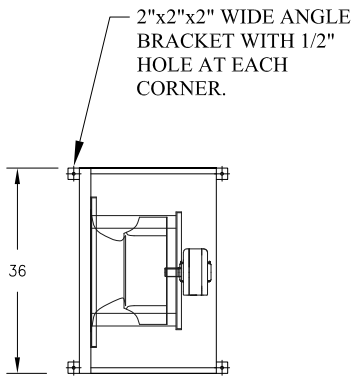
708 N. Vincent Ave Covina, California 91722 • Phone 626-967-7273 • Fax 626-967-7221

AHU-1

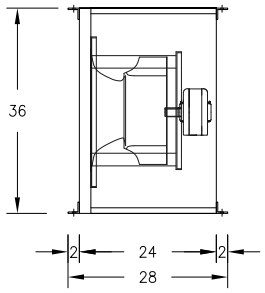
71,000 CFM @ 3.5"TSP

SUPPLY AIR BLOWER:

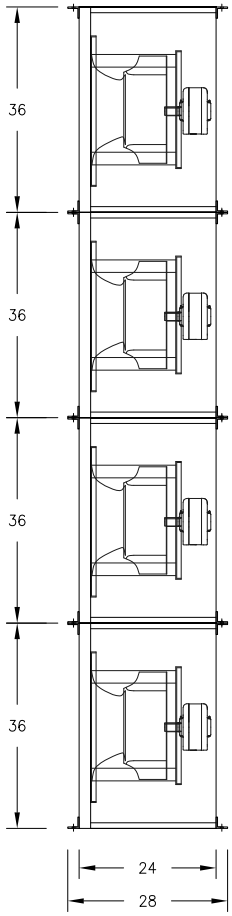
QTY OF 12:
ZIEHL-ABEGG: GR56C
5,917 CFM @ 3.5" TSP 1576 RPM;
WITH A 6 KW MOTOR; 460/3/60



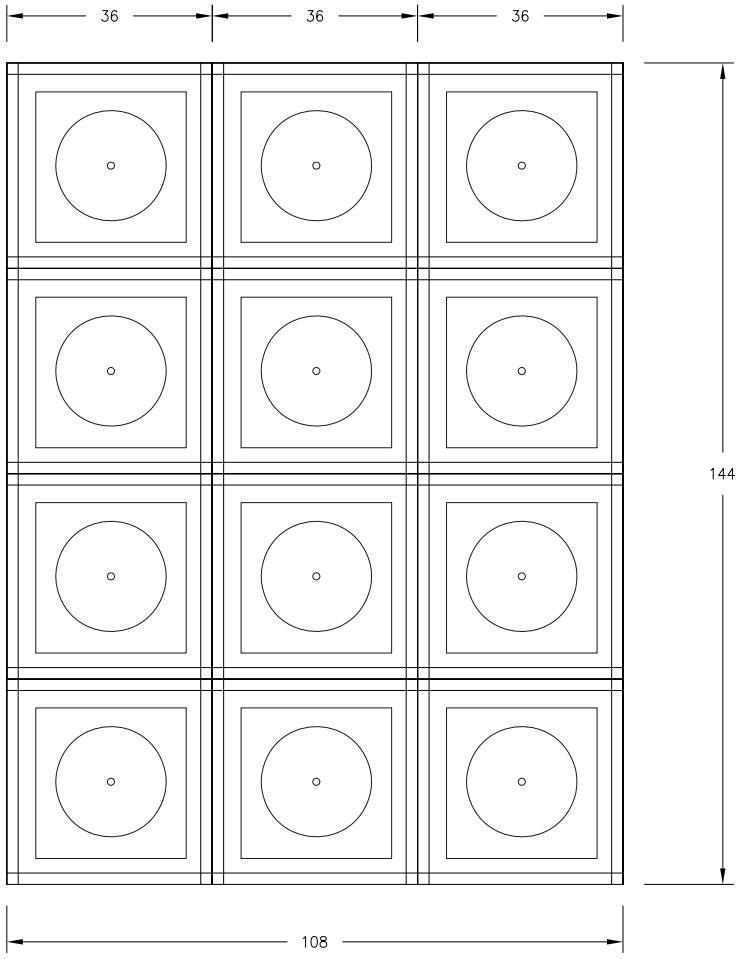
TOP VIEW



SIDE VIEW

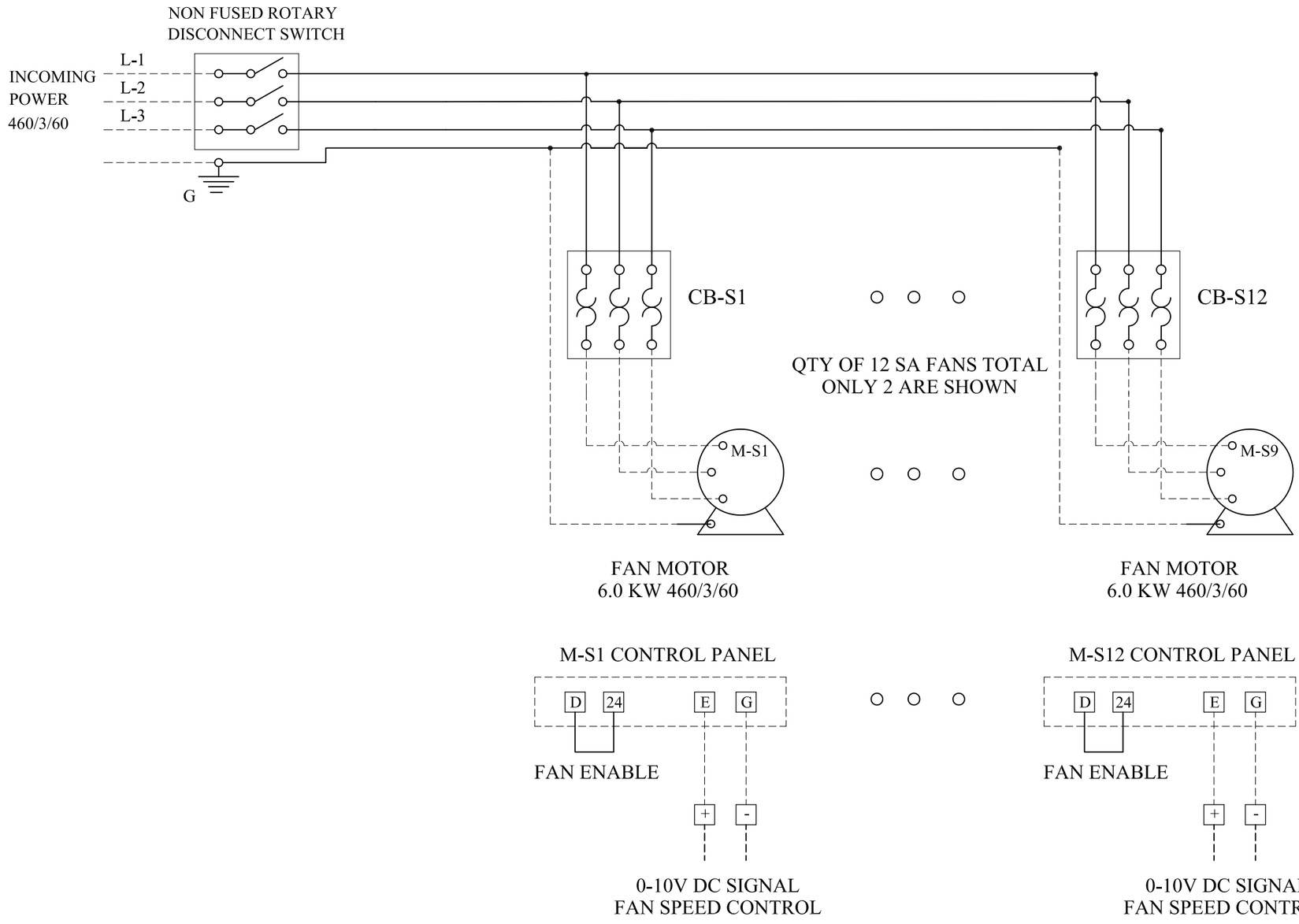


SIDE VIEW



FRONT VIEW

DYNAMIC AIR TECHNOLOGY, INC. MANUFACTURERS OF AIR HANDLING EQUIPMENT	FAN CUBES PHI MOB	SCALE: NTS DATE: 09-15-2020	MODEL NO. D-AHU 71	SHEET NO. AHU-1



NOTES:

TOTAL OF 12 SA FANS TOTAL. ONLY 2 ARE SHOWN ABOVE

MOTOR CONTROL PANEL LOCATED ON THE BACK OF THE MOTOR. MOTOR ENABLE JUMPED AT MOTOR CONTROL PANEL.

EACH MOTOR WILL HAVE A SET OF TERMINAL BLOCKS LOCATED INSIDE THE ENCLOSURE FOR SPEED CONTROL. WIRING BY OTHERS.

ELECTRICAL ENCLOSURE WILL BE SHIPPED LOOSE. FIELD WIRING IS REQUIRED. WIRING BY OTHERS

——————— INDICATES FACTORY WIRING

– – – – – – – – – – – INDICATES FIELD WIRING

DYNAMIC AIR TECHNOLOGY, INC. MANUFACTURERS OF AIR HANDLING EQUIPMENT	AIR HANDLING UNIT	PIH - BROOKSHIRE	SCALE: NTS DATE: 08-28-2020	MODEL NO.	SHEET NO. AHU-1_EL

FANselect

fan data

27.08.2020
version FANselect V 1.01 (200827), AMCA V 1.03 February, 2019 / 1.20.08.27 | 745 | (user raulhuangliu)

1

type		GR56C-ZID.GQ.CR
article no.		116180/A01 | Portfolio STD-WW
arrangement		Multiple Fans arrangement 12 [3|3|3|3]

technical data

motor		ECblue
Efficiency class		IE5
mains supply	-	3~ 460V 60Hz
ambient temperature, max. limit (t_r)	°C	40
efficiency grade η_{statA}	%	69,9
efficiency grade **N_{actual}** | N_{target}		**72,3** | 62
ErP-conformity		2015 | EC controller integrated
grille | influence		no

fan data

SFP-class | SFP-value (P_{SFP})	- | Ws/m³	**4** | 1285
airflow volume (q_V)	ft³/min	71000.0
air velocity	ft/s	366.33
pressure, **stat. (p_{sF})** | tot. (p_F)	in.wg.	**3.500** | 3.707
electrical power input (P_{sys})	W	43073
system eff., **stat. ($\eta_{sF,sys}$)** | tot. ($\eta_{F,sys}$)	%	**67.8** | 71.8
fan speed **(n)** | max. (n_{max})	rpm	**1576** | 1860
fan speed, set value (%n_{max})	%	85
frequency **(f_{BP})** | (f_{max})	Hz	**60** | 60
voltage (U_{DP})	V	460
current (I_{DP})	A	57.31
acoustics, suction side **($L_{w(A),5}$)** | ($L_{w,5}$)	dB	**98** | 106
acoustics, pressure side **($L_{w(A),6}$)** | ($L_{w,6}$)	dB	**101** | 107
dimensions (w x h x d)	in	26.38 x 26.38 x 21.14
product weight (m_{pr})	lb	154.3
k-factor nozzle pres. (k)	-	308
differential pres. nozzle ($p_{sF\ nozzle}$)	Pa	1065

PF:PF_50; BR:BR_01; Mult.Fan:12; q_V:71000.0 ft³/min; p_{sF}:3.500 in.wg.; mains:3~ / 460V / 60 Hz; t_r:68 °F; ρ:0.072 lbs/ft³; STol:+-0 %; BF:GR-H,GR

FANselect

performance curve / acoustics

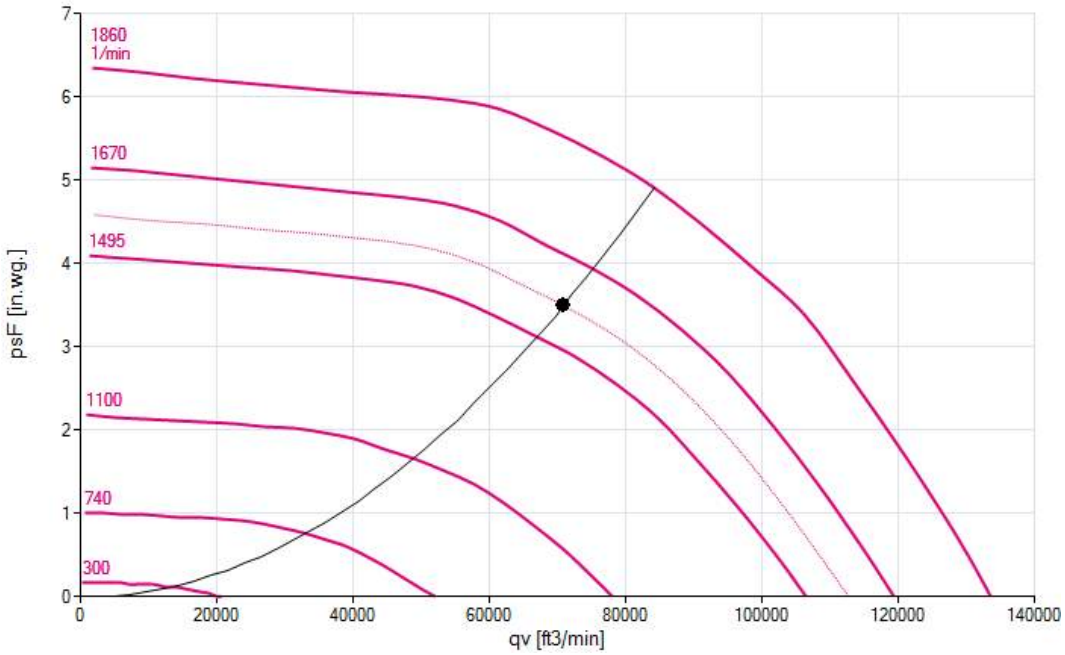
27.08.2020

version FANselect V 1.01 (200827), AMCA V 1.03 February, 2019 / 1.20.08.27 | 745 | (user raulhuangliu)

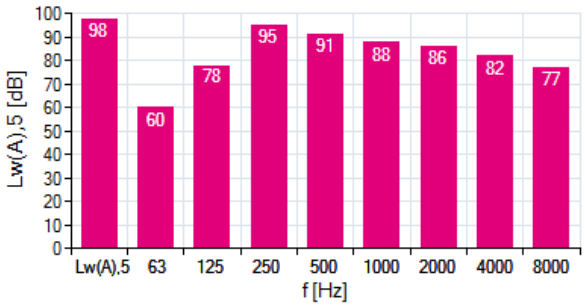
GR56C-ZID.GQ.CR measured in standard nozzle in installation type A according to ISO 5801

1 116180/A01 | Portfolio STD-WW | Multiple Fan 12 [3|3|3|3] measurement density 0.072 [lbs/ft³]

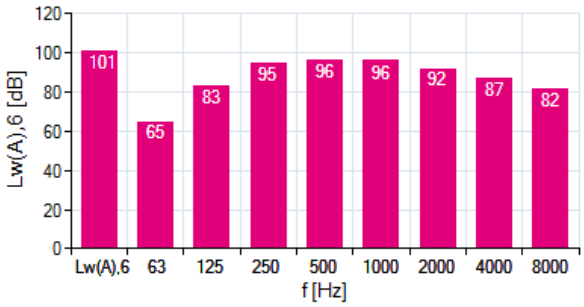
air performance p_{sF}



acoustics ($L_{w(A),5}$)



acoustics ($L_{w(A),6}$)



1 GR56C-ZID.GQ.CR									
f [Hz]	sum	63	125	250	500	1000	2000	4000	8000
$L_{w(A),5}$	98	60	78	95	91	88	86	82	77
$L_{w,5}$	106	86	92	106	96	88	85	81	78

f [Hz]	sum	63	125	250	500	1000	2000	4000	8000
$L_{w(A),6}$	101	65	83	95	96	96	92	87	82
$L_{w,6}$	107	91	97	105	100	96	91	86	83

FANselect

efficiency grade / power input

27.08.2020

version FANselect V 1.01 (200827), AMCA V 1.03 February, 2019 / 1.20.08.27 | 745 | (user raulhuangliu)

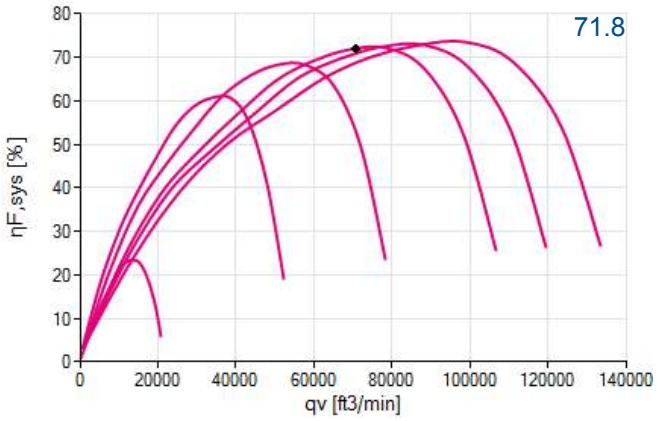
GR56C-ZID.GQ.CR

measured in standard nozzle in installation type A according to ISO 5801

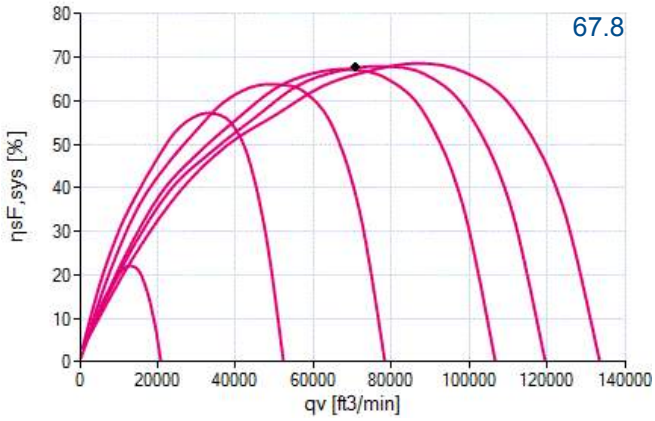
1 116180/A01 | Portfolio STD-WW | Multiple Fan 12 [3|3|3|3]

measurement density 0.072 [lbs/ft³]

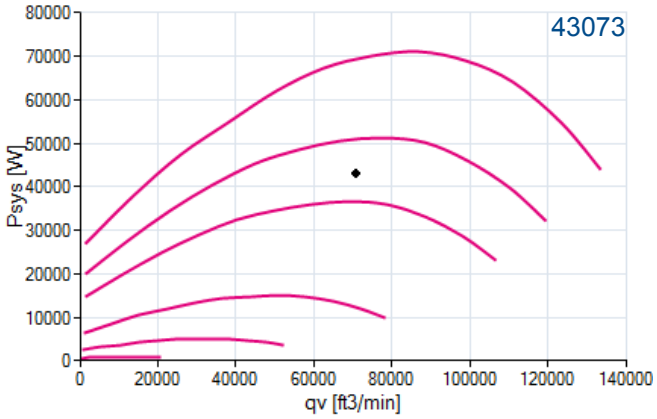
efficiency grade $\eta_{F,sys}$



efficiency grade $\eta_{sF,sys}$



power input P_{sys}



FANselect

nominal values

27.08.2020
version FANselect V 1.01 (200827), AMCA V 1.03 February, 2019 / 1.20.08.27 | 745 | (user raulhuangliu)

1

GR56C-ZID.GQ.CR
116180/A01 | Multiple Fan 12 [3|3|3|3]

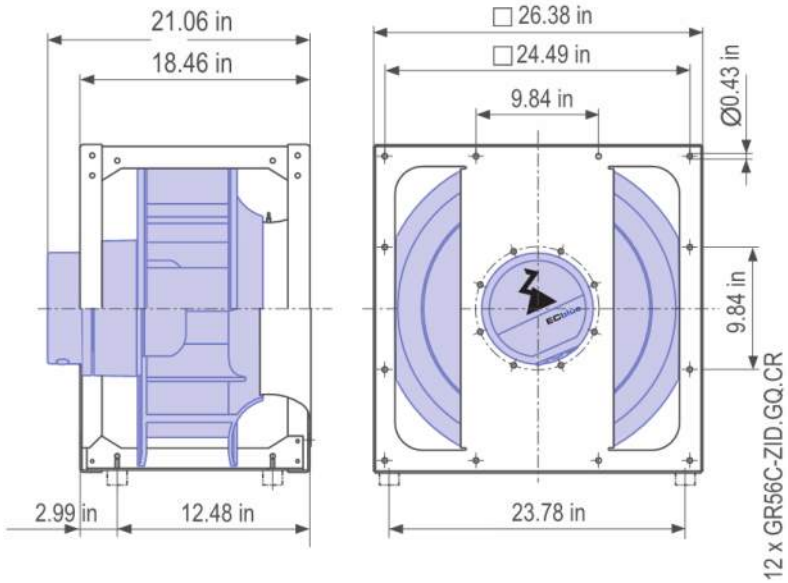
12 x (nominal values for one fan)
3~ 380-480V 50Hz P1 6.00kW
9.40-7.40A 1860/MIN 40°C
3~ 380-480V 60Hz P1 6.00kW
9.40-7.40A 1860/MIN 40°C
IP55 THCL155

drawing

27.08.2020
version FANselect V 1.01 (200827), AMCA V 1.03 February, 2019 / 1.20.08.27 | 745 | (user raulhuangliu)

1

GR56C-ZID.GQ.CR
116180/A01 | Multiple Fan 12 [3|3|3|3]



wiring diagram

27.08.2020
version FANselect V 1.01 (200827), AMCA V 1.03 February, 2019 / 1.20.08.27 | 745 | (user raulhuangliu)

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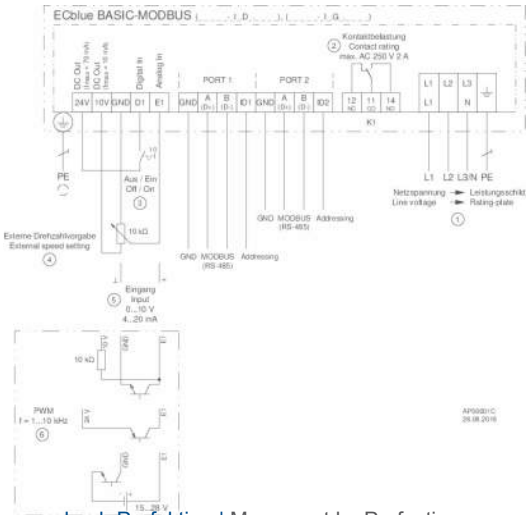
GR56C-ZID.GQ.CR
116180/A01 | Multiple Fan 12 [3|3|3|3]



DYNAMIC AIR TECHNOLOGY, INC.
Manufacturers of Custom Air Handling Equipment

SUBMITTAL

(01-24-2018)

Similar Project Sample Submittal

PROJECT: **EL CAJON ADMINISTRATION BUILDING**

708 N. Vincent Ave Covina, California 91722 • Phone 626-967-7273 • Fax 626-967-7221

DYNAMIC AIR TECHNOLOGY, INC.

Manufacturers of Custom Air Handling Equipment

PROJECT: EL CAJON ADMINISTRATION BUILDING

Fan Cubes:

- Quantity of 18 fans with fan cubes will be shipped loose. Joining hardware will be provided.
- Direct drive plenum fans each with 5 HP ODP premium efficiency motor.
- Cube frame will be constructed from formed, 12 gauge G-90 galvanized steel.
- Exterior panels of the cube will be 16 gauge G-90 galvanized steel.
- Inner liner of the cube will be perforated 20 gauge G-90 galvanized steel.
- Cubes will have 2" thick, 1.76# density fiberglass insulation.
- Cube exterior will be painted with two component polyurethane paint rated for 1,000 hour salt spray.
- The bottom 6 fan cubes will have 2"x3"x3"W angles welded at the four corners with ½" pre-drilled holes for anchoring. Anchoring hardware provided by others.

Exclusions: Electrical Controls and Wiring; Installation; Anchoring Hardware; Blank Off Material

Coils:

- Quantity of 6 standalone CHW cooling coils will be shipped loose. Coils will be built according to the submittal selections.

Exclusions: Coil Valves; Drain Pans

Filters:

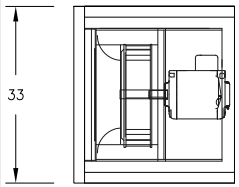
- Filters will be shipped loose. They will include 2" thick, MERV 8 pleated filters and 12" thick, MERV 13 rigid filters per the submittal cut sheets.

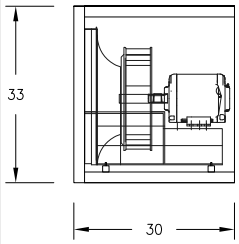
Exclusions: Filter Clips; Frames; Gauges; Tubes and Pressure Tips

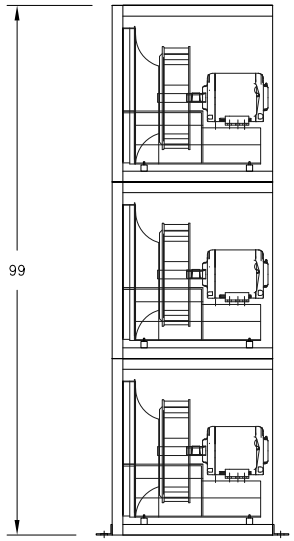
76,600 CFM TOTAL

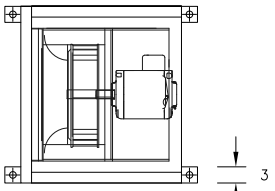
FANS:

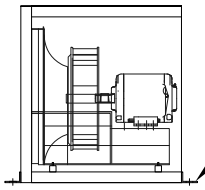
QUANTITY OF 18
ZIEHL-ABEGG: MODEL # ER45C
4,256 CFM EACH @ 4.50" TSP; 2264 RPM; 4.16 BHP
WITH 5 HP ODP PREMIUM EFFICIENCY MOTOR
460/3/60



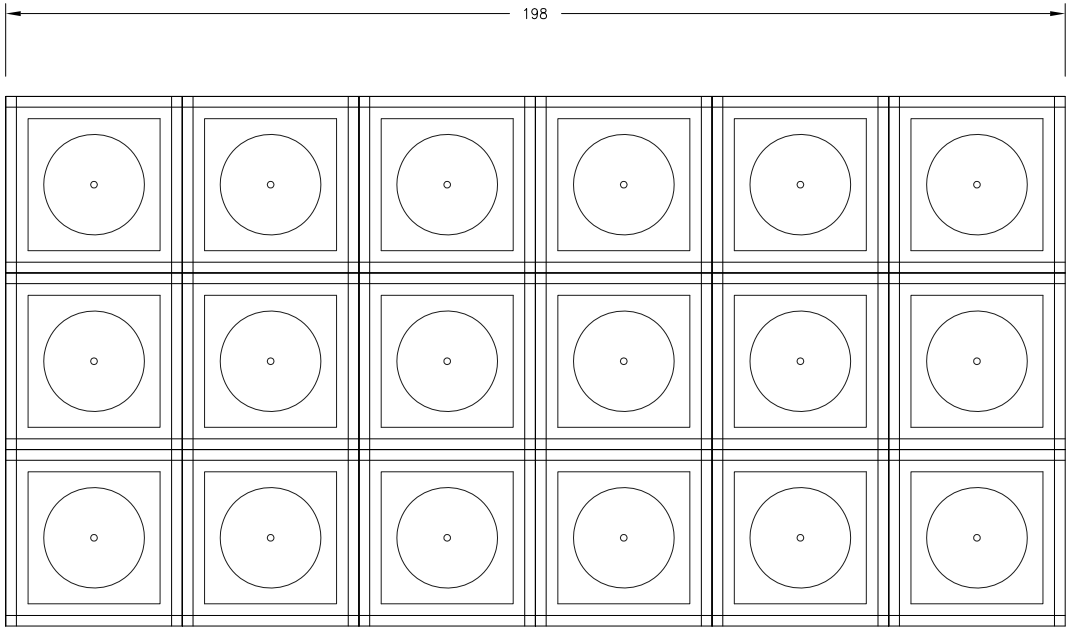








2"x3"x3" WIDE ANGLE BRACKET WITH 1/2" HOLE AT EACH CORNER. ONLY BOTTOM SIX CUBES WILL HAVE ANGLE BRACKETS.



DYNAMIC AIR TECHNOLOGY, INC. MANUFACTURERS OF AIR HANDLING EQUIPMENT	FAN CUBES EL CAJON ADMINISTRATION BUILDING	SCALE: NTS DATE: 01-24-2018	MODEL NO. D-AHU 76	SHEET NO. CUBE-1

Quantity of 18 fans.
Total = 76,600 CFM

ZIEHL-ABEGG

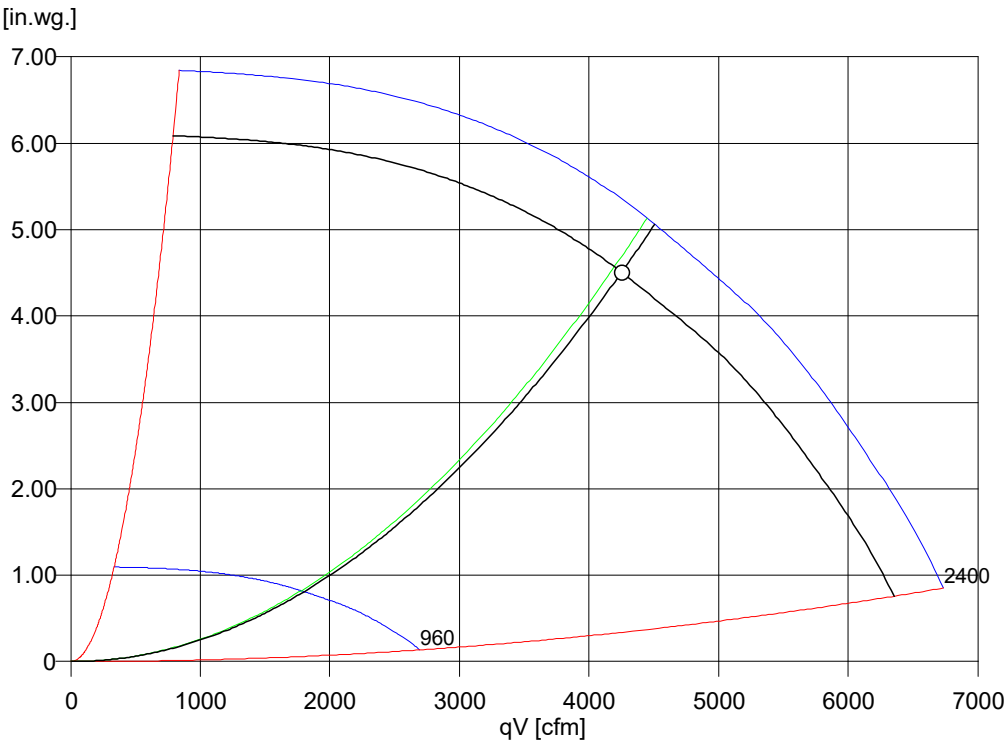
Version 5.1b / 3143 March 2011

Fan type ER45C-4DM.F7.1R Art.No. 112817/AS03

01/24/18

Fan data

qV	4256 cfm
psF	4.50 in.wg.
pd2	0.24 in.wg.
n	2264 rpm
BHP	4.16
BHPmax	4.17
ηtL	76.6 %
ηS	72.7 %
ρ	0.075 lbs/ft³
	at 68°F, 0ft



Motor data

NEMA Premium Efficiency
184T OPSB
THCL155 3~ 460 V/60 Hz Y

Pnom	5.0 Hp
nnom	1750 rpm
ηM	90.2 %
Inom	6.60 A
Mnom	20.36 Nm
fop	78 Hz

Sound data

Inlet Lwi	74	77	82	84	81	78	75	73		89 dB
Inlet LwiA	49	62	73	81	81	79	76	72		86 dB
Outlet Lwo	77	80	89	89	91	86	81	77		96 dB
Outlet LwoA	51	65	81	86	91	87	82	76		94 dB
Octave centre freq.	63	125	250	500	1000	2000	4000	8000	Hz	sum

Supplements

P1	3.55 kW (incl. VFD efficiency at ηM = 90.2%)
PSFP	1771 W/(m³/s)
fmax	82 Hz
nmax	2400 rpm

Additional information

k-fact.(C-nozzle, ρ = 0.075 lbs/ft³)	1830 (effective pressure 5.38 in.wg.)
max. dimensions WxHxL	24.80 x 25.59 x 28.35 in
Recommended housing width	32.46 x 32.46 in
Weight	141 lbs

Accessories (optional)

Rubber damper 30/30/M8/55	Art.No. 00090144
Spring damper SN 6	Art.No. 02006447
ZA guard grill	Art.No. 00409762
Flexible inlet collar	Art.No. 00406515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DYNAMIC AIR TECHNOLOGY PROJECTS IN WASHINGTON

Pierce County Skills Center Phase II Bethel Public Schools	Erickson McGover Hargis Engineers
Pasco Process Water Reuse Facility City of Pasco	Cascade Earth Sciences
LaConner Elementary School LaConner School District	Hutteball & Oremus Hargis Engineers
Renton Academy Renton School District	Greene Gasaway Architects Hultz BHU Engineers
Randal Townsend Apartments Tacoma Washington	Casey + Dechant Architects LNS Engineers
Harmony Elementary Mt. Baker School District	King Architecture Hargis Engineers
Wilson High School Tacoma School District	NAC Hargis Engineers
Renton Technical College Buildings B&L Renton Technical College	SM Stemper Architects Bogard Engineers
Fire Station 32 City of Seattle	Bohlin Cywinski Jackson Hargis Engineers
Everett North Middle School Everett School District	NAC Tres West Engineers
Madrona K-8 Edmonds School District	Mahlum Metrix Engineers