

Job Name: Hamilton 400 - Centrale

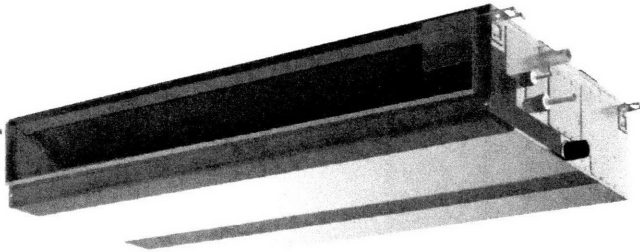
Location: _____

Drawing Reference: _____

Schedule No. _____

System No.: FC 401, 402

Date: _____



GENERAL FEATURES

- R410A refrigerant
- 9-7/8" (250mm) high for low ceiling heights
- Eleven sizes from 6,000 to 54,000 Btu/h
- Ducted fan coil supporting multiple configurations for flexible installation
- Five static pressure settings from 0.14"WG up to 0.60"WG
- Choice of fan speed settings
- Built-in condensate lift; lifts to 27-9/16" (700mm)
- Auto fan mode
- Quiet operation from 26 to 45 dB(A)

SPECIFICATIONS

Capacity*

Cooling.....36,000 Btu/h
 Heating.....40,000 Btu/h

Power

Power Source.....208 / 230V, 1-phase, 60Hz

Power Consumption

Cooling.....0.24 kW
 Heating.....0.22 kW

Current

Cooling.....1.50 A
 Heating.....1.39 A

Minimum Circuit Ampacity (MCA).....3.33 A
 Maximum Overcurrent Protection (MOCP) Fuse.....15 A

External Finish.....Galvanized-steel Sheet

External Dimensions

Inches.....9-7/8 H x 55-1/8 W x 28-7/8 D
 mm.....250 H x 1,400 W x 732 D

Net Weight

Unit.....93 lbs. / 42 kg

Coil Type.....Cross Fin
 (Aluminum Plate Fin and Copper Tube)

Fan

Type x Quantity.....Sirocco Fan x 2
 Airflow Rate (Low-Mid-High).....812 - 989 - 1,165 CFM
 External Static Pressure.....0.14 - 0.20 - 0.28 - 0.40 - 0.60"WG
 (External static pressure is factory set to 0.20"WG)

Motor

Type.....DC Brushless Motor
 Output.....0.244 kW

Air Filter.....Polypropylene Honeycomb

Refrigerant Piping Dimensions

Liquid (High Pressure).....3/8" / 9.52 mm (Brazed)
 Gas (Low Pressure).....5/8" / 15.88 mm (Brazed)

Drainpipe Dimension.....O.D. 1-1/4" / 32 mm

Sound Pressure Levels

Low-Mid-High.....32 - 37 - 41 dB(A)

OPTIONS

- External Heater Adapter.....CN24RELAY-KIT-CM3
- Filter Box (Includes 2" MERV 13 filter).....FBM2-4

* Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:

Cooling: Indoor 80°F (27°C) DB / 67°F (19°C) WB, Outdoor 95°F (35°C) DB

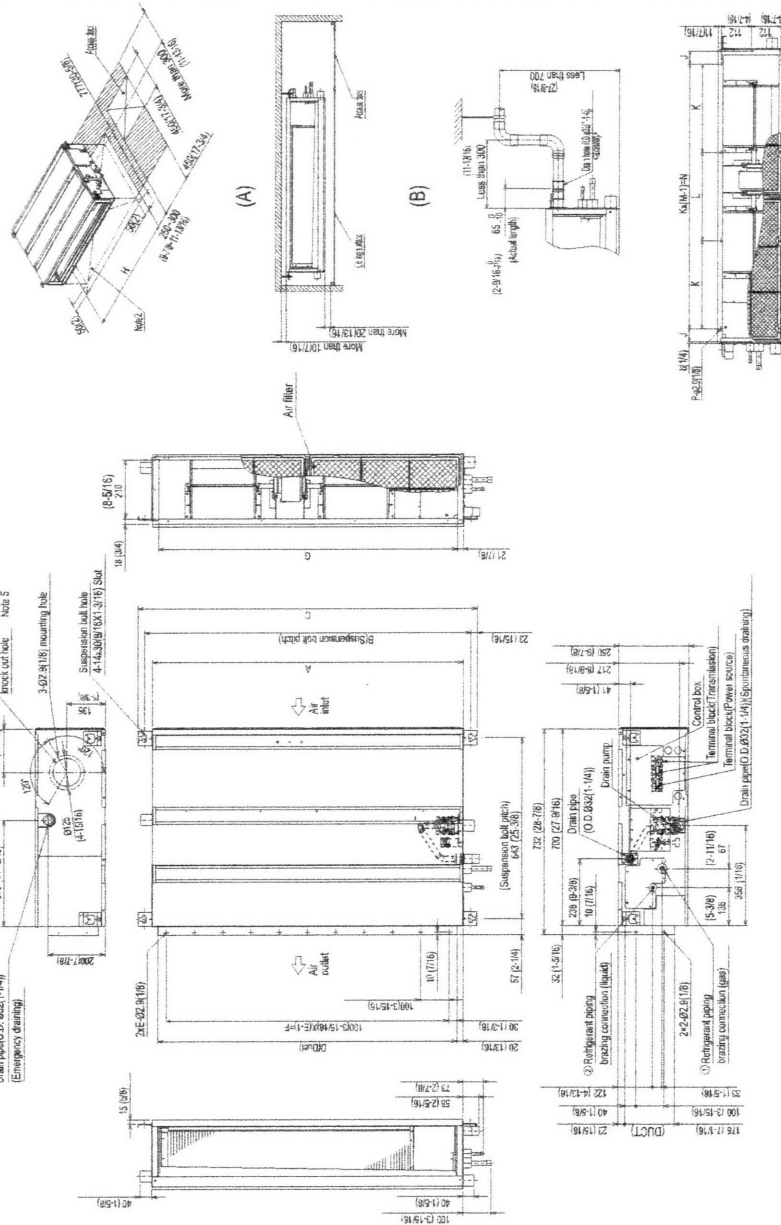
Heating: Indoor 70°F (21°C) DB, Outdoor 47°F (8°C) DB / 43°F (6°C) WB

Note: Ventilation air: Providing sufficient ventilation air is an important part of every building design. ASHRAE Standard 62 provides the minimum ventilation air requirement. Also, check local codes.



2570

Model: PEFY-P36NMAU-E – DIMENSIONS



- (A) Space required for service and maintenance.
- (B) Provide an access door for maintenance at the bottom.

Note

- 1 Use M10 suspension bolts. (not supplied)
- 2 Provide an access door for maintenance at the bottom.
- 3 The dimensions in the table are those of the PEFY-P24, 27, 30, 36, 48, 54NMAU-E models, which have 2 fans. The PEFY-P06, 08, 12, 15, 18NMAU-E model have 1 fan.
- 4 To connect an intake duct, uninstall the air filter on the unit, and install a field supplied air filter on the intake duct on the intake side.
- 5 If using a ventilation air connection, air temperature must be at neutral conditions.

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	① Case pipes ② Liquid pipe	Unit room (ft.)
PEFY-P06,08,12NMAU-E	700	754	800	660	7	600	656	800	44	150	300	4	780	10	1012.7	98.95
	(27.91/16)	(29.11/16)	(31.12)	(26)		(23.5/6)	(25.15/16)	(31.12)	(1.34)	(5.15/16)	(11.12/16)		(30.34)		(192)	(7.14)
PEFY-P15,18NMAU-E	900	954	1000	860	9	800	858	1000	54	250	4	4	980	10		
	(35.7/16)	(37.9/16)	(39.3/16)	(33.7/16)		(31.12)	(33.3/16)	(39.3/16)	(2.3/16)	(10.1/4)			(30.34)			
PEFY-P24,27,30NMAU-E	1100	1154	1200	1060	11	1000	1058	1200	49	330	4	4	980	10		
	(43.3/16)	(45.7/16)	(47.1/4)	(41.3/4)		(39.3/16)	(41.7/16)	(47.1/4)	(1.15/16)	(13)			(30.34)			
PEFY-P36,48NMAU-E	1500	1554	1600	1460	14	1400	1458	1600	54	370	5	5	980	12		
	(59.1/16)	(61.4)	(63.1/16)	(57.1/16)		(55.1/16)	(57.5/16)	(63.1/16)	(2.1/16)	(14.5/16)			(30.34)			
PEFY-P48NMAU-E	1800	1854	1900	1760	16	1700	1758	1900	54	370	5	5	980	12		
	(70.9/16)	(73.3/16)	(75.0/16)	(69.1/16)		(66.1/16)	(68.5/16)	(74.0/16)	(2.3/16)	(14.5/16)			(30.34)			



Mitsubishi Electric Air Conditioning & Refrigeration Systems Works acquired ISO 9001 certification under Series 9000 of the International Standard Organization (ISO) based on a review of quality warranties for the production of refrigeration and air conditioning equipment.

ISO Authorization System
The ISO 9000 series is a plant authorization system relating to quality warranties as stipulated by the ISO. ISO 9001 certifies quality warranties based on the "design, development, production, installation and auxiliary services" for products built at an authorized plant.



Mitsubishi Electric Air Conditioning & Refrigeration Systems Works acquired environmental management system standard ISO 14001 certification.

The ISO 14000 series is a set of standards applying to environmental protection set by the International Standard Organization (ISO).



HVAC Advanced Products Division

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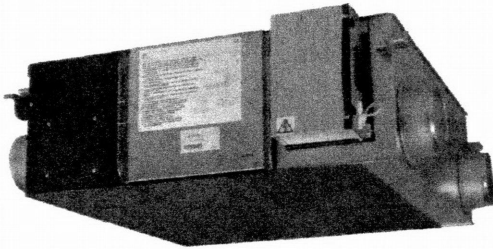
Specifications are subject to change without notice.

Job Name: Ham 2400 - Rentvale

Schedule Reference: ERV4

Date:

ENERGY RECOVERY VENTILATOR



GENERAL FEATURES

- Lossnay® cross-flow energy recovery core
- Minimal cross contamination (<1% overall) between entering and leaving air streams
- Stand-alone control
- M-NET
- External input bypass damper control
- Stand alone or interlocks with all Mitsubishi product

SPECIFICATIONS

Capacity 600 CFM / 17 m³/min

Power

Power Source 208 - 230V, 1-Phase, 60 Hz
 Power Consumption 0.146 - 0.637 kW
 Current 0.72 - 2.90 A
 Starting Current 5.0 A
 Minimum Circuit Ampacity (MCA) 3.6 A
 Maximum Overcurrent Protection (MOCP) 15 A

Controllers

PZ-60DR Lossnay® Controller: Controls 1-15 Lossnay® units, ON/OFF, Fan Speed, and Vent Mode

Operation Mode

- Heat Recovery
- Bypass
- Auto

Air Volume

(fan speed: extra low - low - high - extra high)
 @ 208V 200 - 370 - 520 - 600 CFM
 @ 230V 235 - 430 - 600 - 600 CFM

Temperature recovery efficiency

(fan speed: extra low - low - high - extra high)
 @ 208V 80 - 75 - 68 - 67%
 @ 230V 78 - 73 - 67 - 67%

Enthalpy recovery efficiency

(fan speed: extra low - low - high - extra high)
Heating
 @ 208V 79 - 71 - 65 - 64%
 @ 230V 77 - 68 - 64 - 64%
Cooling
 @ 208V 68 - 59 - 53 - 50%
 @ 230V 67 - 56 - 50 - 50%

External static pressure (In. W.G.)

(fan speed: extra low - low - high - extra high)
 @ 208V 0.07 - 0.24 - 0.48 - 0.56
 @ 230V 0.07 - 0.24 - 0.48 - 0.80

External Finish Galvanized steel sheet

Dimensions

inches 15-3/4 H x 48-1/2 W x 45-1/16 D
 mm 399 H x 1231 W x 1144 D

Net Weight 132 lb / 60 kg

Energy Transfer Lossnay® core

Heat Exchange System Air-to-air total heat (sensible heat + latent heat) exchange, no moving parts

Heat Exchange Material Partition, spacing plate-cellulose fiber membrane

Blower 9.625 in. dia. centrifugal fan

Motor . . . Totally enclosed capacitor permanent split-phase 0.52 HP induction motor, 4 poles, 2 units

Filter Washable fiber (2)

Entering Air Temperature Operation Range

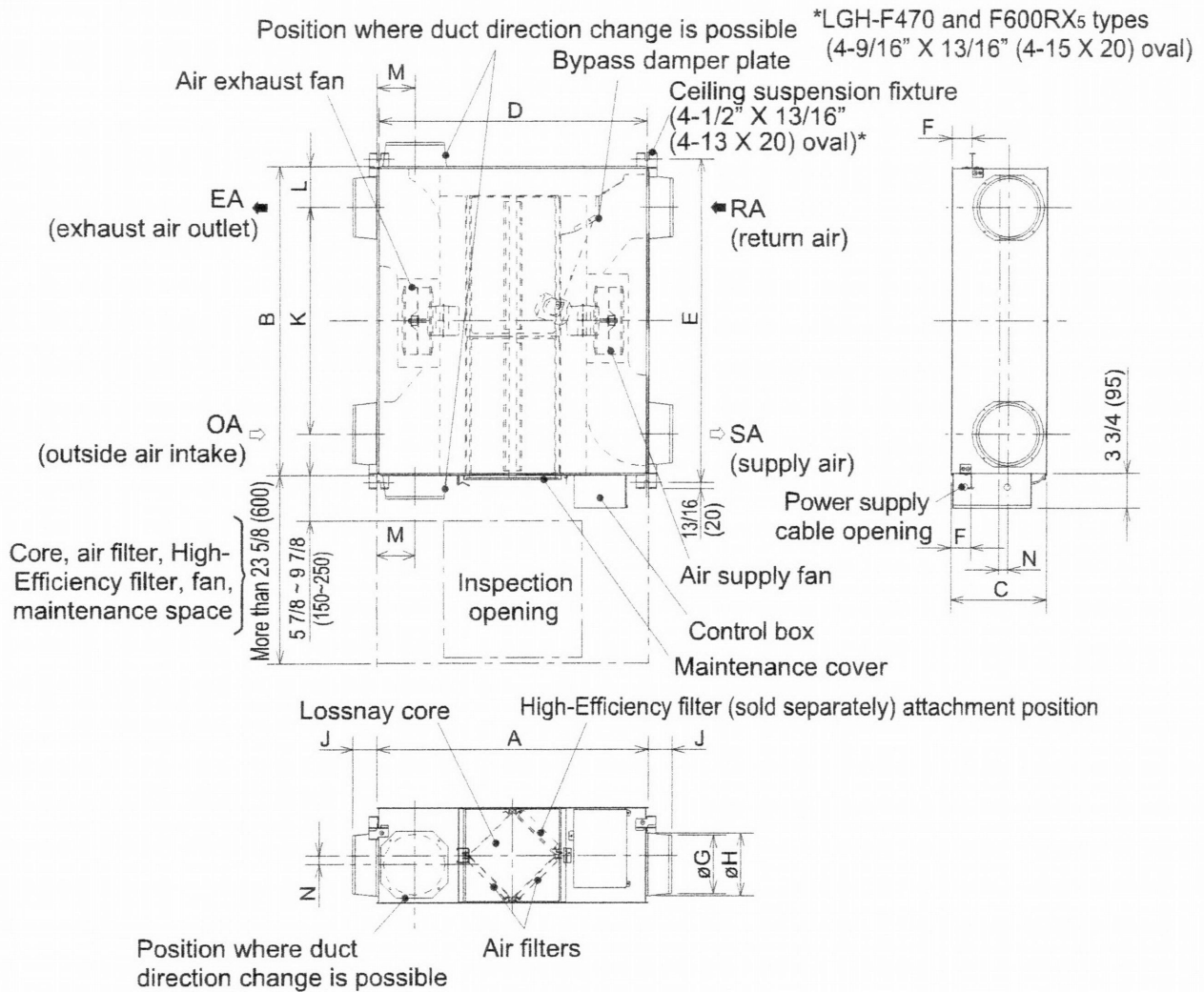
14° F to 104° F (-10° C to 40° C), RH 80% or less

Sound Pressure Level

(fan speed: extra low - low - high - extra high)
 @ 208V 19 - 26.5 - 34 - 36 dB (A)
 @ 230V 21 - 29 - 36.5 - 38 dB (A)

Notes:

Model: LGH-F600RX5-E – DIMENSIONS



Unit: Inch (mm)

Model	Dimensions			Ceiling suspension fixture pitch			Nominal diameter	Duct connecting flange			Duct pitch				Weight
	A	B	C	D	E	F		G	H	J	K	L	M	N	
LGH-F300 RXs	34 15/16 (888)	40 (1016)	12 3/8 (315)	34 1/2 (875)	41 7/8 (1063)	2 9/16 (65)	7 7/8 (200)	7 9/16 (192)	8 3/16 (208)	3 1/8 (79)	29 3/8 (745)	5 5/16 (135.5)	4 7/8 (124)	1 3/16 (30)	73 lbs (33 kg)
LGH-F470 RXs	45 1/16 (1144)	39 1/2 (1004)	15 3/4 (399)	39 3/4 (1010)	40 13/16 (1036)	15 5/16 (389)	9 7/8 (250)	9 1/2 (242)	10 3/16 (258)	3 1/8 (79)	27 3/16 (690)	6 3/16 (157)	6 1/2 (165)	-	119 lbs (54 kg)
LGH-F600 RXs	45 1/16 (1144)	48 1/2 (1231)	15 3/4 (399)	39 3/4 (1010)	49 3/4 (1263)	15 5/16 (389)	9 7/8 (250)	9 1/2 (242)	10 3/16 (258)	3 1/8 (79)	36 1/8 (917)	6 3/16 (157)	6 1/2 (165)	-	132 lbs (60 kg)



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FORM# LGH-F600RX5 - 201210
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STRUCTURAL CALCULATIONS

FOR

HAMILTON
529 SW 3rd AVE
PORTLAND, OR 97204

-- 4th FLOOR MECHANICAL UNITS --



RECEIVED

NOV 06 2013

FACILITIES PERMITS

Contents

Detail A	D1
Calculations	C1 - C3
Enclosures	E1 - E4

Contact Person: John E Nordling, PE



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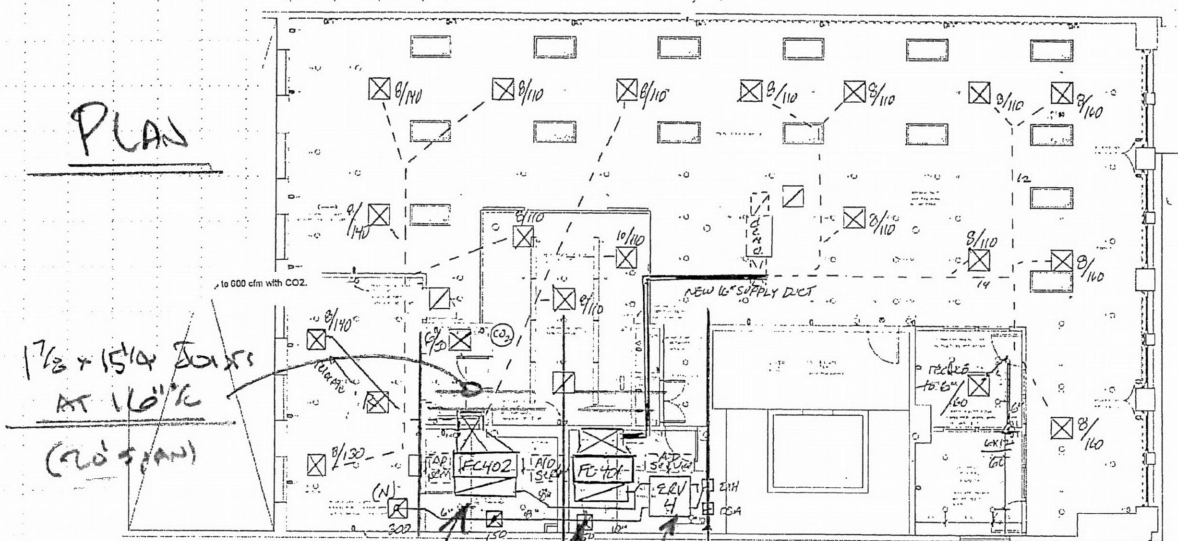
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HAMILTON
4TH FLOOR UNITS

OREGON HEATING & AIR CONDITIONING

Date: NOV 2013 By: JEN Sheet No.: COVER

PLAN

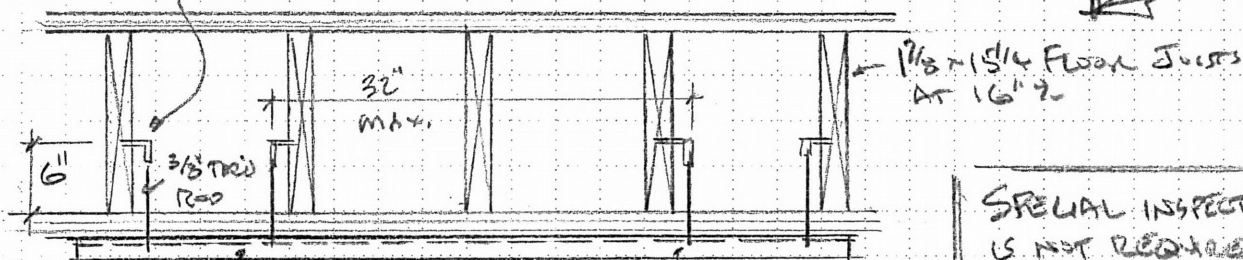


1 1/2 x 15/16 Joists
AT 16\"/>

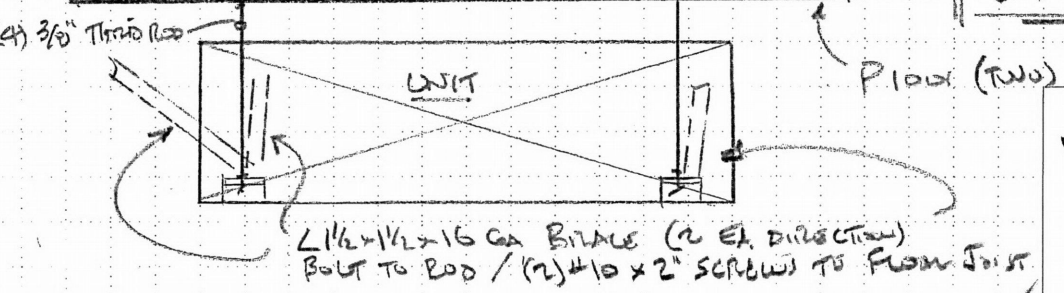
HVAC Plan
1/8\"/>

LOSSNAY ERV2 - 132#
PEFY-P36NMHV-E - 155#

FLOOR
SIDE ATTACHED
'SAMMIT' ANCHORS
(4) PER FLOOR UNIT



SPECIAL INSPECTION
IS NOT REQUIRED

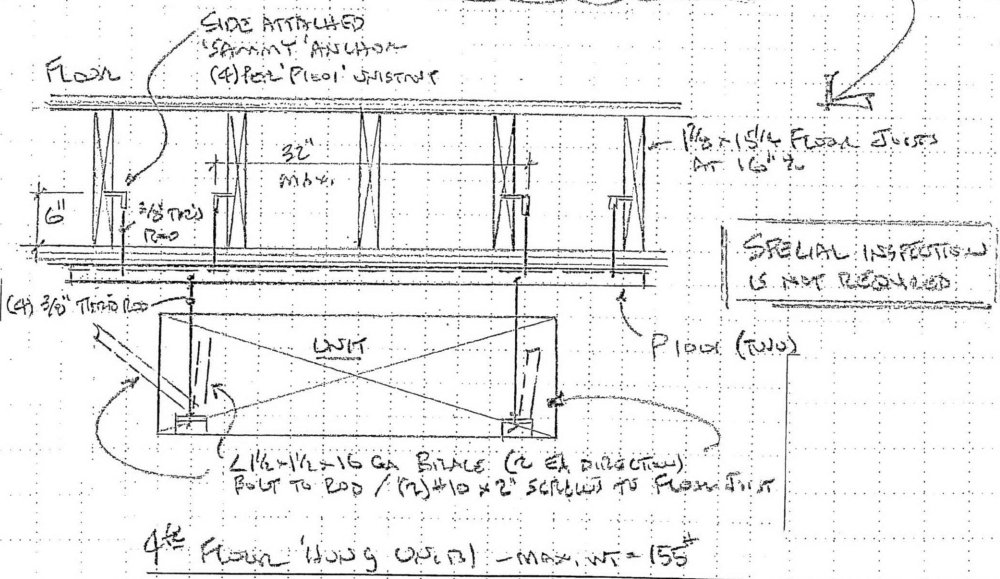
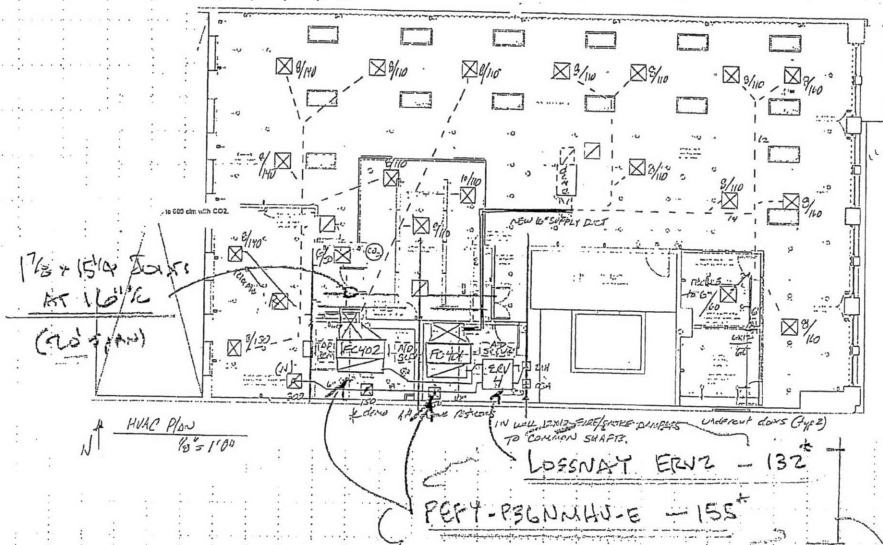


(A) 4th Floor 'HUNG UNIT' - MAX. WT = 155#

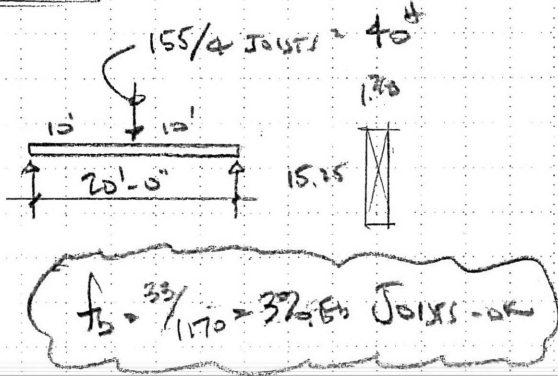


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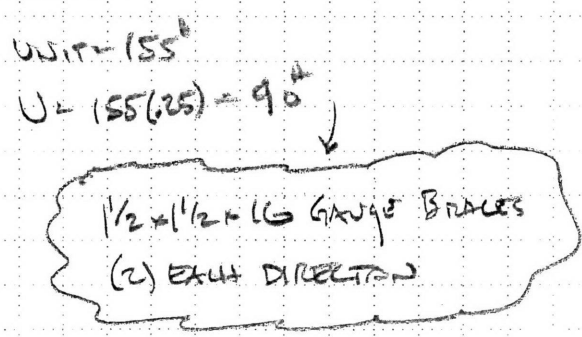
Proj. No.: 13-405
HAMILTON
4TH FLOOR UNITS
OREGON HEATING & AIR CONDITIONING
Date: NOV 2013 By: JEN Sheet No.: D1



GRAVITY



SEISMIC



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Proj. No.: 13-405
HAMILTON
4TH FLOOR UNITS

OREGON HEATING & AIR CONDITIONING

Date: NOV 2013 By: JEN Sheet No.: C1

MULTI-SPAN TIMBER BEAM DESIGN

MECHANICAL UNITS AT 4TH FLOOR

<u>GENERAL DATA</u>		MECH
		<u>1</u>
All Spans Simple Support ??	:	YES
Spans Length	ft :	20.00
End Fixity:	:	Pin:Pin
Beam Width	in :	1.875
Beam Depth	in :	15.25
<u>CALCULATED VALUES</u>		-OK-
F'b-Modified Allow.	psi :	1168.5
fb - Actual.	psi :	33.0
F'v-Modified Allow.	psi :	180.0
fv (actual) * 1.5	psi :	1.0
Moment @ Left	k-in :	0.0
Moment @ Right	k-in :	0.0
Max. Mom. @ Mid-Span	k-in :	2.4
	X-Dist	ft : 10.00
Shears:	Left	k : 0.02
	Right	k : -0.02
Reaction @ Left	DL	k : 0.00
	LL	k : 0.02
	Total	k : 0.02
Reaction @ Right	DL	k : 0.00
	LL	k : 0.02
	Total	k : 0.02
Max. Defl. @ Mid Span	in :	-0.012
	X-Dist	ft : 10.00
<u>DESIGN DATA</u>		
Le: Unsupported Length	ft :	0.00
Fb:Basic Allowable	psi :	1200.0
Fv:Basic Allowable	psi :	180.0
Elastic Modulus	ksi :	1700
Load Duration Factor	:	1.00
<u>APPLIED LOADS</u>		
Use Live Load on This Span	?	Yes
Point.....	DL	# :
	LL	# : 40.00
	X-Dist.	ft : 10.00
<u>QUERY VALUES</u>		
Location	ft :	0.00
Shear	# :	0.02
Moment	k-in :	0.00
Deflection	in :	0.000

$f_b = 33 / 1.12 = 37 = F_b$

MINIMUM
 STUT. TRIP -OK

CR



Earthquake Hazards Program

2005 ASCE 7 Standard

Location 45° 31' 9.16" N Ss and S1 = Mapped Spectral Acceleration Values
 122° 40' 30.75" W 529 SW 3rd Ave, Portland, OR 97204

Ground Motion Ss **0.984** S1 **0.345**

Occupancy Category	II	Site Coefficients	Fa	1.11
Site Class	D		Fv	1.71
Importance Factor	1.00		SMS Fa * Ss	1.089
Height of Structure	110.0 ft		SMI Fv * S1	0.590
Design Category (SDC)	D		Sds (2/3) SMS	0.726
			SD1 (2/3) SMI	0.393

Air Side HVAC

ap 2.50 Rp 6.00

$$Fp = \frac{0.4 \cdot a_p \cdot S_{DS} \cdot I_p}{R_p} \left(1 + 2 \cdot \frac{z}{h} \right) \cdot W_p$$

z = 110.0 ft ASD
 Fp = 0.36 Wp -> * 0.7 0.254

z = 50.0 ft
 Fp = 0.23 Wp -> * 0.7 0.162

Fp MIN = 0.3 Sds Ip Wp
 = 0.218 Wp -> * 0.7 0.152

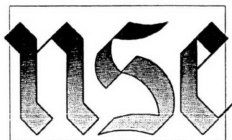
Fp MAX = 1.6 Sds Ip Wp
 = 1.16 Wp -> * 0.7 0.813

$$Eq = \mathbf{0.162}W + 0.2 SDS W$$

W : Weight of Unit

16%

Say 25%
 conservative



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Proj. No.: 13-405

HAMILTON
 4TH FLOOR UNITS

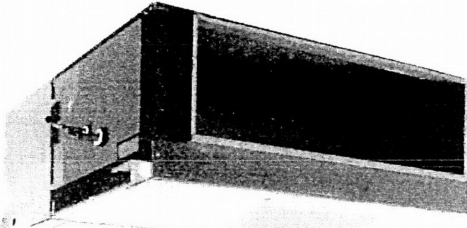
OREGON HEATING & AIR CONDITIONING

Date: NOV 2013 By: JEN Sheet No.: 13

Job Name: Ham 4

Schedule Reference:

Date:



GENERAL FEATURES

- Dual set point functionality
- High external static pressure capabilities
- Ducted fan coil supports multiple configurations for flexible installation

OPTIONS

- Drain pump.....PAC-KE04DM-F
- Condensate Pump.....SI1730-230
- Long life filter.....PAC-KE89LAF
- Filter Box.....PAC-KE140TB-F
- CN24 Relay Kit.....CN24RELAY-KIT-CM3

SPECIFICATIONS

Capacity*

Cooling 36,000 Btu/h
 Heating 40,000 Btu/h

Power

Power Source 208-230V, 1 phase, 60Hz

Power Consumption

Cooling (208/230V) 0.683 / 0.754 kW
 Heating (208/230V) 0.683 / 0.754 kW

Current

Cooling (208/230V) 3.38 / 3.73 A
 Heating (208/230V) 3.38 / 3.73 A
 Minimum Circuit Ampacity (MCA) (208/230V) . 4.23 / 4.67 A
 Maximum Overcurrent Protection (MOCP) 15A

External Finish Galvanized steel plate

Dimensions

Inches 14-31/32 h x 47-1/4 w x 35-7/16 d
 mm 380 h x 1200 w x 900 d

Net Weight 155 lb / 70 kg

Coil Type Cross fin (aluminum plate fin and copper tube)

Fan

Type x Quantity Sirocco fan x 2
 Airflow Rate (Low - High) 936 - 1342 CFM
 External Static Pressure
 @ 208V 0.20 (default) - 0.64 in. WG
 @ 230V 0.40-0.60 (default) - 0.80 in. WG
 Motor Type Single phase induction motor

Air Filter Filter must be procured locally

Refrigerant Pipe Dimensions

R410A
 Liquid 3/8" / 9.52 mm flare
 Gas 5/8" / 15.88 mm flare

Drainpipe Dimension O.D.1-1/4" / 32 mm

Sound Level (Low - High)

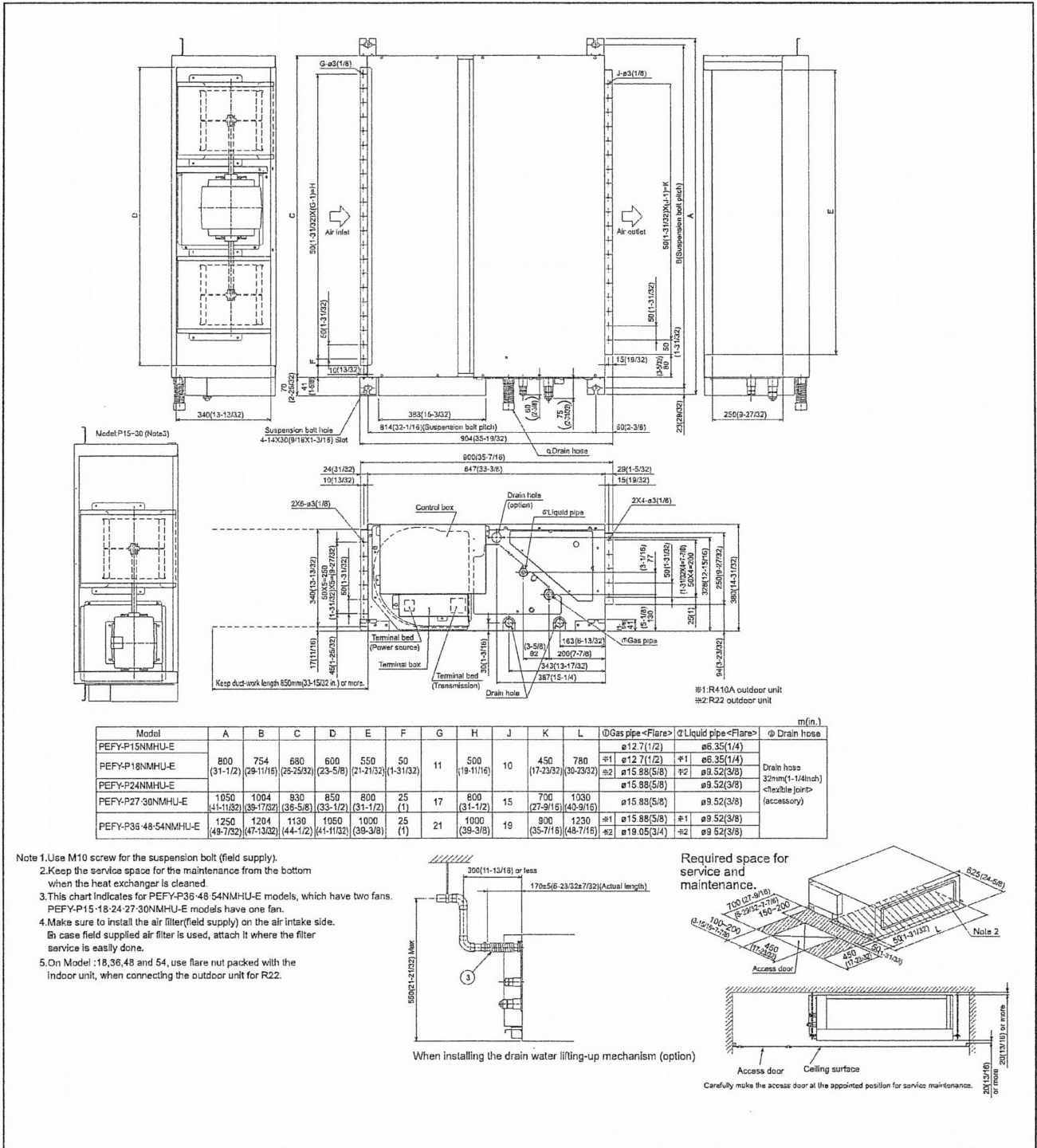
@ 208V 31 - 41 dB(A)
 @ 230V 38 - 44 dB(A)

* Cooling / Heating capacity indicated at the maximum value at operation under the following conditions:
 Cooling | Indoor: 80° F (27° C) DB / 67° F (19° C) WB, Outdoor 95° F (35° C) DB
 Heating | Indoor: 70° F (21° C) DB, Outdoor 47° F (8° C) DB / 43° F (6° C) WB

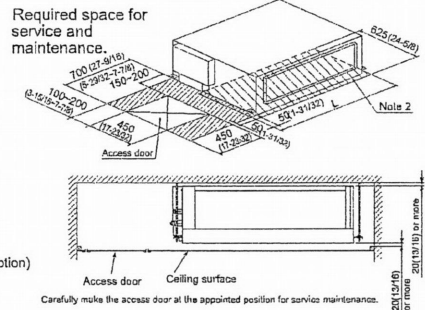
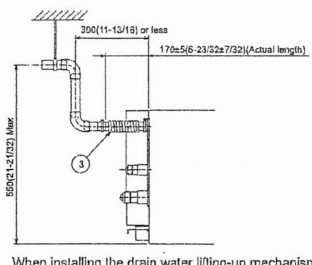
Notes:



Model: PEFY-P36NMHU-E – DIMENSIONS



- Note 1. Use M10 screw for the suspension bolt (field supply).
- Note 2. Keep the service space for the maintenance from the bottom when the heat exchanger is cleaned.
- Note 3. This chart indicates for PEFY-P36-48 54NMHU-E models, which have two fans. PEFY-P15-18-24-27-30NMHU-E models have one fan.
- Note 4. Make sure to install the air filter (field supply) on the air intake side. In case field supplied air filter is used, attach it where the filter service is easily done.
- Note 5. On Model :18,36,48 and 54, use flare nut packed with the indoor unit, when connecting the outdoor unit for R22.



Intertek

FORM# PEFY-P36NMHU-E - 201308

Specifications are subject to change without notice.
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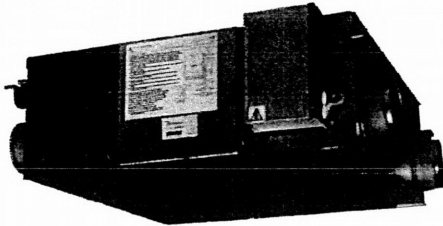
E2

Job Name: Ham 2

Schedule Reference: ERV2

Date:

ENERGY RECOVERY VENTILATOR



GENERAL FEATURES

- Lossnay® cross-flow energy recovery core
- Minimal cross contamination (<1% overall) between entering and leaving air streams
- Stand-alone control
- M-NET
- External input bypass damper control
- Stand alone or interlocks with all Mitsubishi product

SPECIFICATIONS

Capacity 600 CFM / 17 m³/min

Power
 Power Source 208 - 230V, 1-Phase, 60 Hz
 Power Consumption 0.146 - 0.637 kW
 Current 0.72 - 2.90 A
 Starting Current 5.0 A
 Minimum Circuit Ampacity (MCA) 3.6 A
 Maximum Overcurrent Protection (MOCP) 15 A

Controllers

PZ-60DR Lossnay® Controller: Controls 1-15 Lossnay® units, ON/OFF, Fan Speed, and Vent Mode

Operation Mode

- Heat Recovery
- Bypass
- Auto

Air Volume

(fan speed: extra low - low - high - extra high)
 @ 208V 200 - 370 - 520 - 600 CFM
 @ 230V 235 - 430 - 600 - 600 CFM

Temperature recovery efficiency

(fan speed: extra low - low - high - extra high)
 @ 208V 80 - 75 - 68 - 67%
 @ 230V 78 - 73 - 67 - 67%

Enthalpy recovery efficiency

(fan speed: extra low - low - high - extra high)
Heating
 @ 208V 79 - 71 - 65 - 64%
 @ 230V 77 - 68 - 64 - 64%
Cooling
 @ 208V 68 - 59 - 53 - 50%
 @ 230V 67 - 56 - 50 - 50%

External static pressure (In. W.G.)

(fan speed: extra low - low - high - extra high)
 @ 208V 0.07 - 0.24 - 0.48 - 0.56
 @ 230V 0.07 - 0.24 - 0.48 - 0.80

External Finish Galvanized steel sheet

Dimensions

inches 15-3/4 H x 48-1/2 W x 45-1/16 D
 mm 399 H x 1231 W x 1144 D

Net Weight 132 lb / 60 kg

Energy Transfer Lossnay® core

Heat Exchange System Air-to-air total heat (sensible heat + latent heat) exchange, no moving parts

Heat Exchange Material Partition, spacing plate-cellulose fiber membrane

Blower 9.625 in. dia. centrifugal fan

Motor Totally enclosed capacitor permanent split-phase 0.52 HP induction motor, 4 poles, 2 units

Filter Washable fiber (2)

Entering Air Temperature Operation Range

14° F to 104° F (-10° C to 40° C), RH 80% or less

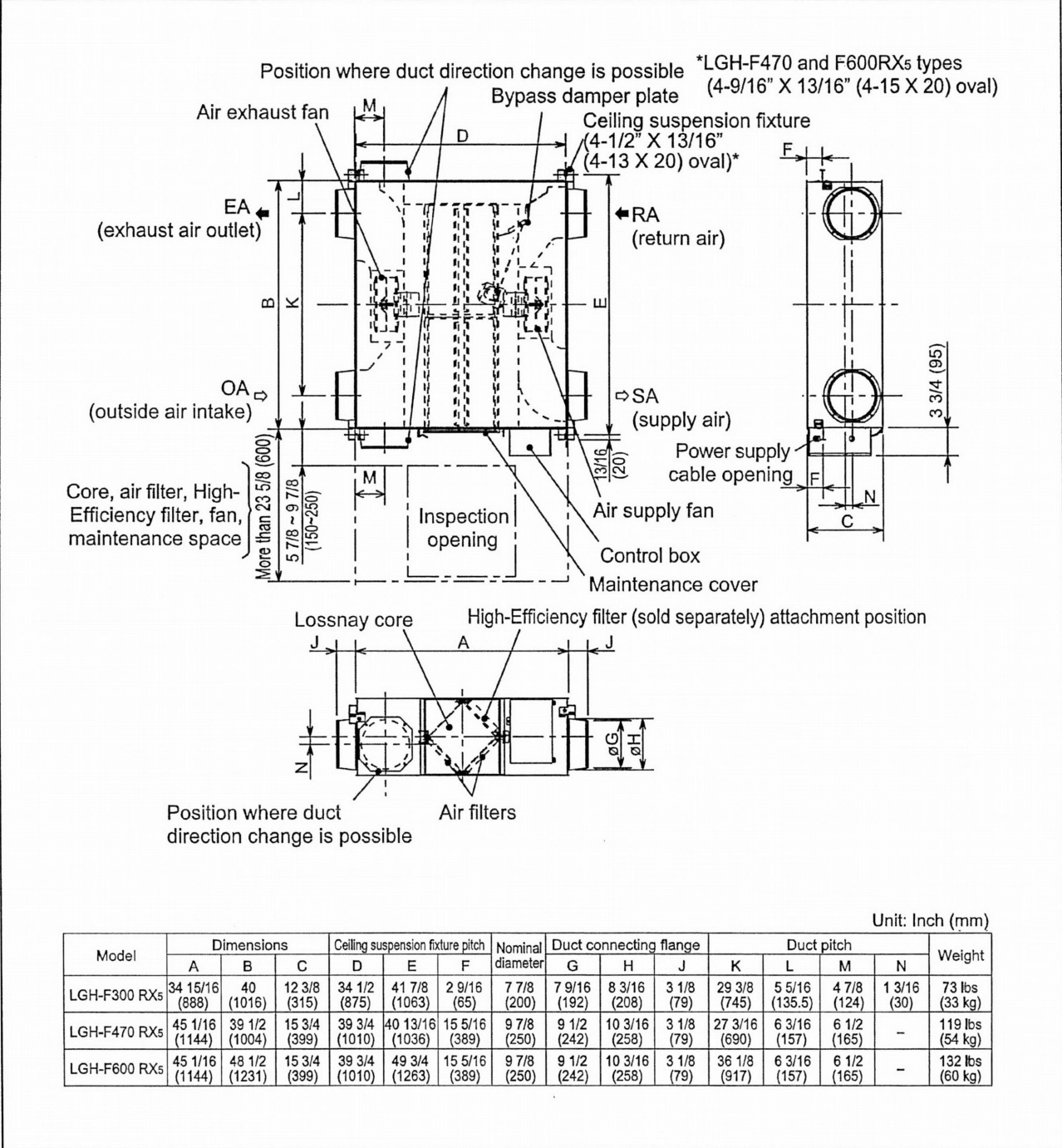
Sound Pressure Level

(fan speed: extra low - low - high - extra high)
 @ 208V 19 - 26.5 - 34 - 36 dB (A)
 @ 230V 21 - 29 - 36.5 - 38 dB (A)

Handwritten note: 132 #

Notes:

Model: LGH-F600RX5-E – DIMENSIONS



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