MECHANICAL LEGEND

- SUPPLY AIR DIFFUSER
- RETURN AIR DIFFUSER
- EXHAUST AIR DIFFUSER
- DIRECTIONAL AIR FLOW
- MANUAL VOLUME DAMPER
- SUPPLY/OUTSIDE AIR DUCT UP & DOWN
- RETURN AIR DUCT UP & DOWN
- EXHAUST AIR DUCT UP & DOWN
- (D) DEMOLISH
- (E) EXISTING
- CONNECT TO EXISTING
- THERMOSTAT
- TEMPERATURE SENSOR
- NOTE
- EQUIPMENT DESIGNATOR
- GATE VALVE/SHUT-OFF VALVE SEE SPECS
- CHECK VALVE
- BALANCING VALVE
- FLOW CONTROL/LIMITING VALVE
- THERMOMETER
- DIRECTION OF FLOW
- PUMP
- STRAINER W/DRAIN VALVE
- PRESSURE GUAGE
- PETE'S PLUG
- DOUBLE CHECK ASSEMBLY
- PRESSURE REDUCING VALVE
- UNION
- 2-WAY CONTROL VALVE
- 3-WAY CONTROL VALVE
- TRIPLE DUTY VALVE
- CAP
- MOTORIZED DAMPER
- MOTORIZED DAMPER
- BALL/SHUT-OFF VALVE(SEE SPECS)
- FIRE DAMPER
- FIRE / SMOKE DAMPER
- SMOKE DAMPER
- FAN MOTOR

AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
B.D.	BOTTOM OF DUCT
BHP	BRAKE HORSEPOWER
BOG	BOTTOM OF GRILLE
BTU	BRITISH THERMAL UNITS
CFM	CUBIC FEET PER MINUTE
CONN.	CONNECTION
CONT.	CONTINUATION
CW	DOMESTIC COLD WATER
DB	DRY BULB
DIA.	DIAMETER
DIST.	DISTRIBUTION
EXH	EXHAUST AIR
EDB	ENTERING DRY BULB TEMPERATURE
EWB	ENTERING WET BULB TEMPERATURE
EWT	ENTERING WATER TEMPERATURE
FF	FINISH FLOOR
FIXT.	FIXTURE
F.O.B.	FLAT ON BOTTOM
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT.	FEET / FOOT
GA.	GAUGE
GEXH	GREASE EXHAUST AIR DUCT
GPM	GALLONS PER MINUTE
H	HEIGHT
HP	HORSEPOWER
I.D.	INSIDE DIAMETER
IN.	INCHES
L	LENGTH
LBS.	POUNDS
LDB	LEAVING DRY BULB
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
MA	MAKE UP AIR
MAX.	MAXIMUM
MBH	THOUSANDS OF BTUs PER HOUR
MD	MOTORIZED DAMPER
MIN.	MINIMUM
MVD	MANUAL VOLUME DAMPER
NC	NOISE CRITERIA
N.C.	NORMALLY CLOSED
N.I.M.	NOT IN MECHANICAL
NO.	NUMBER
N.O.	NORMALLY OPEN
O.A.	OUTSIDE AIR
P	PERSON
PSI	POUNDS PER SQUARE INCH
P/T	PRESSURE / TEMPERATURE
R.A.	RETURN AIR
RECT.	RECTANGULAR
REQ'D	REQUIRED
S.A.	SUPPLY AIR
S.P.	STATIC PRESSURE
SQ.	SQUARE
TEMP.	TEMPERATURE
TYP.	TYPICAL
VAV	VARIABLE AIR VOLUME
W	WIDTH
WB	WET BULB
WPD	WATER PRESSURE DROP
ø	DIAMETER

- (E) EXISTING
- (D) DEMOLISH
- NEW WORK
- G — (G) NATURAL GAS
- CD — (CD) CONDENSATE DRAIN
- RF — (RF) TWO OR THREE REFRIGERANT LINES
- HWS — (HWS) HEATING WATER SUPPLY
- HWR — (HWR) HEATING WATER RETURN
- CHS — (CHWS) CHILLED WATER SUPPLY
- CHR — (CHWR) CHILLED WATER RETURN

EQUIPMENT MAINTENANCE CLEARANCE AND ACCESS

3.2 DUCTWORK INSULATION

A. Ductwork: Insulate the following:

1. All supply and return ductwork in systems routed in unconditioned spaces or exposed to the outside conditions.
2. All outside air intake ducts.
3. All ductwork required to be insulated by code.
4. The last 5' of duct work connected to a louver or exhaust termination.

B. Insulation Thickness: Select board and blanket insulation of thickness required to provide the following installed R-value.

1. All heating or cooling system supply and return ducts located on the exterior of the insulated building envelope, including ventilated attics, and all outside air intake ducts, R-8.
2. All heating and cooling system supply and return ducts located in unconditioned spaces within the building insulation envelope, R-5.
3. All heating and cooling system supply ducts located in conditioned spaces and where exposed in unfinished spaces or concealed from view in finished spaces, R-3.3. Exposed ductwork in finished spaces shall not be externally insulated.
4. Ducts located within or below concrete slabs on grade, R-4.

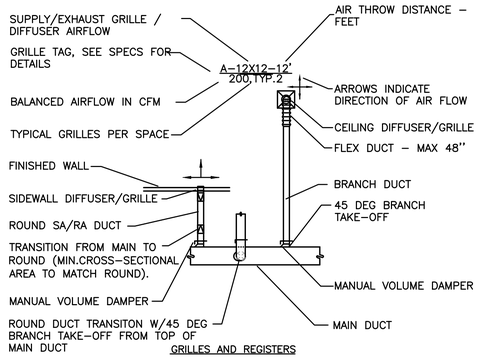
C. Fittings: Install with wire, straps, and duct adhesive as required. To prevent sagging on all rectangular or square ducts over 24" wide, install Gramweld or equal welding pins on the bottom. Maximum spacing 18" on center in both directions.

D. Installation: Applied with butt joints, all seams sealed with vapor seal mastic or taped with 2" wide vapor-proof, pressure-sensitive tape. Seal all penetrations with vapor barrier adhesive.

E. Internally Lined Ductwork: Where internally lined ductwork is indicated on the Drawings and/or specified, no exterior insulation is required. Select duct lining to provide the required R-value. Carefully lap the ends of the exterior insulation a minimum of 6" past the interior insulation unless otherwise shown. Seal the end of vapor barrier jacket to the duct with mastic where the vapor barrier is required.

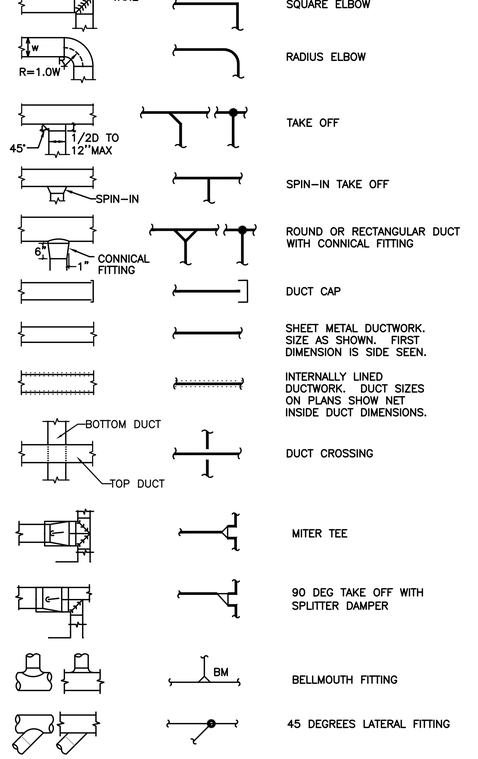
E.1. Line Supply and Return ducts for 10' on intake and discharge of fan.
E.2. Line Supply ducts routed in vertical shafts directly below RTUs

AIR DISTRIBUTION DETAILS



GRILLES AND REGISTERS

AIR DISTRIBUTION DETAILS



SYSTEM COMMISSIONING-VERIFICATION AND TESTING REQUIREMENTS:
ASHRAE 90.1-2019 REQUIREMENTS
SECTION 4.2.5 THROUGH 4.2.5.3

THE OWNER OR GC SHALL PROCURE A COMMISSIONING PROVIDER THAT MEETS ONE OF THE FOLLOWING.

THE COMMISSIONING PROVIDER SHALL BE:
a. A THIRD PARTY ENTITY NOT ASSOCIATED WITH THE BUILDING PROJECT
b. AN OWNER'S QUALIFIED EMPOLYEE.
c. AN INDIVIDUAL ASSOCIATED WITH THE DESIGN FIRM, BUT NOT DIRECTLY ASSOCIATED WITH THE DESIGN OR INSTALLATION OF THE BUILDING SYSTEMS.

EXCEPTIONS:
1. BUILDING IS LESS THAN 10,000 SQ FT

CONTRACTOR RESPONSIBILITIES
- THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING ALL THE REQUIREMENTS OF ASHRAE 90.1-2019.
- THE GENERAL CONTRACTOR OR OWNER SHALL HIRE AND UTILIZE AN APPROVED CX AGENT
- THE CX AGENT SHALL

1. PREPARE A CX PLAN
2. OVERSEE THE TAB MEASUREMENTS
3. CONDUCT THE PR-FUNCTIONAL & FUNCTIONAL TESTS
4. PREPARE THE PRELIMINARY CX REPORT
5. REVIEW THE TAB REPORT
6. REVIEW THE O&M'S
7. PREPARE THE SYSTEMS MANUALS

- SYSTEMS REQUIRED TO BE COMMISSIONED

1. SERVICE WATER HEATERS
2. MIXING VALVES & RECIRC SYSTEMS
3. ROOFTOP UNIT - HALLWAY VENTILATION
4. SPLIT SYSTEM FAN COILS
5. PTHP'S (SAMPLE SELECTION).
6. DWELLING UNIT EXHAUST FANS (SAMPLE SELECTION).
7. LIGHTING CONTROL SYSTEMS
8. OCCUPANCY SENSORS
9. EMERGENCY POWER SYSTEMS (GENERATOR)
10. THERMOSTAT OPERATIONS AND SET POINTS
11. FIRE PIT 7 BBQ TIMERS AND AUTO-SHUT OFF
12. FIRE PUMP AND DOMESTIC WATER BOOSTER PUMP.

MECHANICAL GENERAL NOTES

A. THE DRAWINGS ARE DIAGRAMMATIC. PROVIDE ALL MATERIAL (NEW AND UNDAMAGED) AND LABOR FOR A COMPLETE AND OPERABLE SYSTEM. VERIFY ALL BUILDING MEASUREMENTS DIMENSIONS AND EQUIPMENT LOCATIONS BEFORE PROCEEDING WITH ANY OF THE WORK.

B. VERIFY ALL EXISTING CONDITIONS RELATIVE TO THE SCOPE OF WORK. REPORT DISCREPANCIES BACK TO THE ENGINEER.

C. VERIFY INDICATED (E)DUCTWORK/PIPE SIZES PRIOR TO RECONNECTING NEW EQUIPMENT. EQUIPMENT SHALL NOT BE CONNECTED TO EXISTING DUCT/PIPE OF SMALLER DIAMETER THAN NEW DUCT/PIPE. REPORT DISCREPANCIES BACK TO ENGINEER.

D. DO NOT FABRICATE EQUIPMENT SUPPORTS/BASES W/O CONFIRMING SPACE EXISTS AND THE BUILDING ATTACHMENT POINTS.

E. REFER TO THE MECHANICAL SPECIFICATIONS FOR MATERIALS, EQUIPMENT, AND ADDITIONAL CONSTRUCTION INSTRUCTIONS NOT COVERED BY THESE PLANS.

F. ALL INSTALLATIONS SHALL COMPLY WITH APPLICABLE FEDERAL AND STATE CODES INCLUDING, 2019 OREGON STRUCTURAL SPECIALTY CODE (OSSC) INCLUDING APPENDIX N FOR OREGON FIRE CODE REGULATIONS, 2021 OREGON PLUMBING SPECIALTY CODE (OPSC), 2019 OREGON MECHANICAL SPECIALTY CODE (OMSC), 2021 OREGON ENERGY EFFICIENCY SPECIALTY CODE (OEESC)-BASED ON ASHRAE 90.1-2019, AND NATIONAL FIRE PROTECTION ASSOCIATION (NFPA). WHERE TWO CODES DIFFER THE MORE STRICT OF THE TWO SHALL BE FOLLOWED.

G. OBTAIN ALL NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE GOVERNING AUTHORITIES HAVING JURISDICTION. SUBMIT ALL CERTIFICATES PRIOR TO ACCEPTANCE.

H. COORDINATE ALL MECHANICAL AND CONTROL WORK WITH GENERAL CONTRACTOR, CONTROL CONTRACTOR, ELECTRICAL AND ARCHITECTURAL.

I. COORDINATE OTHER TRADES FOR PATCH/REPAIR OF WALLS WHERE EXISTING SENSORS ARE REMOVED OR MODIFIED.

J. PATCH & REPAIR WALLS / FLOORS / CEILING WHERE OLD DUCTWORK/PIPES HAVE BEEN REMOVED TO MATCH EXISTING FINISHES.

K. COORDINATE WITH OTHER CRAFTS AS REQUIRED TO COMPLETE WORK IN ACCORDANCE WITH CONSTRUCTION SCHEDULE.

L. PROVIDE OWNER INSTRUCTION BY QUALIFIED PERSONNEL ON EQUIPMENT AND SYSTEMS AT OWNER'S REQUEST.

M. ALL DUCTWORK SHALL BE GALVANIZED STEEL, UNLESS OTHERWISE INDICATED, CONFORMING TO LATEST SMACNA, ASHRAE, OMSC, NFPA, AND UL STANDARDS.

N. MANUFACTURERS AND MODEL NUMBERS LISTED IN THE EQUIPMENT SCHEDULES ARE THE BASIS OF DESIGN.

O. CUT WALLS FOR PROPER EQUIPMENT, DUCT OR PIPE INSTALLATION. FILL HOLES WHICH ARE CUT OVERSIZED FOR A TIGHT FIT AROUND OBJECTS PASSING THROUGH.

P. PROVIDE UL LISTED FIRESTOP SYSTEM TO MAINTAIN THE CODE REQUIRED F AND T RATING OF THE CONSTRUCTION ASSEMBLY AT A DUCT/PIPE PENETRATION THROUGH A RATED BUILDING CONSTRUCTION.

Q. INSTALL LABELS ON ALL MECHANICAL EQUIPMENT. SEE SPECIFICATIONS FOR CRITERIA.

R. CONTROLS AND WIRING SHALL MEET ALL ELECTRICAL REQUIREMENTS OF APPLICABLE ELECTRICAL SPECIFICATIONS AND REQUIREMENTS OF OWNER, BUILDING OFFICIALS AND EQUIPMENT SUPPLIERS OF EQUIPMENT INSTALLED ON PROJECT.

S. ELECTRIC MOTORS SHALL HAVE BUILT-IN THERMAL OVERLOAD PROTECTION OR BE PROTECTED EXTERNALLY WITH SEPARATE THERMAL OVERLOAD DEVICES, WITH LOW-VOLTAGE RELEASE OR LOCK OUT AS REQUIRED.

T. ALL NEW EQUIPMENT, PIPING, CONDUIT, AND DUCTWORK SHALL BE INSTALLED PER CURRENT SEISMIC CODE REQUIREMENTS.

U. PROVIDE LOW LEAK AUTOMATIC DAMPERS ON OUTSIDE AIR, EXHAUST AIR AND RELIEF AIR CONTROL DAMPERS WHERE THESE ARE INDICATED.

MECHANICAL SHEET INDEX

PRELIMINARY NOT FOR CONSTRUCTION

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830 sw 10th avenue #200 portlandoregon97205
503 243 2252
www.carletonhart.com

8400 SE Lake Road.
Suite 201
Portland, OR 97222
Voice (503) 652-3690
Fax (503) 652-3691

TISTILAL VILLAGE APARTMENTS
7633 N HEREFORD AVENUE
PORTLAND OR
NAYA

PERMIT SET

TITLE SHEET & MECHANICAL LEGEND

PROJECT NO.
20005

07/25/22

REVISIONS: 1

MFIA Consulting Engineers INC.
2007 S.E. Ash St.
Portland, OR 97214
PHN: (503) 234-0548
FAX: (503) 234-0677
WWW.MFIA-ENG.COM
CONTACT: MARK DENYER

JACOBS

7-25-22
REGISTERED PROFESSIONAL ENGINEER
54,607
OREGON
JULY 11, 2008
MARK R. DENYER
EXPIRES: 31DEC23

M0.01

INDOOR UNITS – *

MARK NUMBER	FC-1 9 MBH	FC-2 12 MBH	FC-3 18 MBH	FC-4 24 MBH	FC-5A / FC-5B / FC-5C 9 MBH	FC-6A / FC-6B 9 MBH	FC-7 36 MBH	FC-8 18 MBH	FC-9A / FC-9B 9 MBH	FC-9C / FC-9D 12 MBH	FC-10A 9 MBH	FC-10B 18 MBH
SYSTEM	STUDIO UNITS	1 BEDROOM UNITS	2 BEDROOM UNITS	3 BEDROOM UNITS	1ST, 2ND, 3RD LAUNDRY	2ND, 3RD LOUNGE	COMMUNITY ROOM	BIKE ROOM	WELLNESS 102 & OFFICE 103	OFFICE 104 & LOBBY–MAIL	OFFICE 128	FLEX–LIVING
TYPE	WALL MOUNTED	WALL MOUNTED	WALL MOUNTED	WALL MOUNTED	WALL MOUNTED	WALL MOUNTED	DUCTED	WALL MOUNTED	WALL MOUNTED	WALL MOUNTED	WALL MOUNTED	WALL MOUNTED
EFFICIENCY	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT
NOMINAL COOLING CAPACITY	9,000 BTUH	12,000 BTUH	18,000 BTUH	24,000 BTUH	9,000 BTUH	9,000 BTUH	36,000 BTUH	18,000 BTUH	9,000 BTUH	12,000 BTUH	9,000 BTUH	18,000 BTUH
HEATING CAPACITY	9,000 BTUH	12,000 BTUH	18,000 BTUH	24,000 BTUH	9,000 BTUH	9,000 BTUH	36,000 BTUH	18,000 BTUH	9,000 BTUH	12,000 BTUH	9,000 BTUH	18,000 BTUH
TOTAL SUPPLY CFM	459	459	706	919	459	459	1,130	706	459	459	459	706
OSA CFM	–	–	–	–	–	–	–	–	–	–	–	–
EXTERNAL SP. ("H20)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
VOLTS/PHASE	–	–	–	–	–	–	–	–	–	–	–	–
MCA/MOP	–	–	–	–	–	–	–	–	–	–	–	–
WEIGHT	25	25	35	50	25	25	75	35	25	25	25	35
BASIS OF DESIGN	LG LSN090HSV5	LG LSN120HSV5	LG LSN180HSV5	LG LSN240HSV5	LG LSN090HSV5	LG LSN090HSV5	LG LHN368HV	LG LSN180HSV5	LG LSN090HSV5	LG LSN120HSV5	LG LSN090HSV5	LG LSN180HSV5
OUTDOOR UNIT	HP-1 3/4 TON	HP-2 1 TON	HP-3 1.5 TON	HP-4 2 TON	HP-5 2 TON	HP-6 1.5 TON	HP-7 3 TON	HP-8 1.5 TON	HP-9 3 TON		HP-9 3 TON	

* – PROVIDE ALL UNITS THAT CANNOT BE DRAINED BY GRAVITY WITH CONDENSATE PUMP, ROUTE ALL CONDENSATE LINES HIDDEN WITHIN STRUCTURE TO AN APPROVED LOCATION PROVIDED BY THE PLUMBER.

OUTDOOR UNITS – SPLIT SYSTEM HEAT PUMP

MARK NUMBER	HP-1 3/4 TON	HP-2 1 TON	HP-3 1.5 TON	HP-4 2 TON	HP-5 2 TON	HP-6 1.5 TON	HP-7 3 TON	HP-8 1.5 TON	HP-9 3 TON	HP-10 2 TON	HP-11 3 TON	HP-12 3 TON
SYSTEM	STUDIO UNITS	1 BEDROOM UNITS	2 BEDROOM UNITS	3 BEDROOM UNITS	1ST, 2ND, 3RD LAUNDRY	2ND, 3RD LOUNGE	COMMUNITY ROOM	BIKE ROOM	WELLNESS,OFFICE,MAIL,LOBBY	OFFICE & FLEX/LIVING	WEST CORRIDOR	EAST CORRIDOR
TYPE	1–PORT HEAT PUMP	1–PORT HEAT PUMP	1–PORT HEAT PUMP	1–PORT HEAT PUMP	3–PORT HEAT PUMP	2–PORT HEAT PUMP	1–PORT HEAT PUMP	1–PORT HEAT PUMP	4–PORT HEAT PUMP	3–PORT HEAT PUMP	4–PORT HEAT PUMP	4–PORT HEAT PUMP
NORMAL COOLING CAPACITY	9000 BTUH	12,000 BTUH	18,000 BTUH	24,000 BTUH	24,000 BTUH	18,000 BTUH	36,000 BTUH	18,000 BTUH	36,000 BTUH	24,000 BTUH	36,000 BTUH	36,000 BTUH
NORMAL HEATING CAPACITY	9,000 BTUH	12,000 BTUH	20,000 BTUH	24,000 BTUH	24,000 BTUH	24,000 BTUH	36,000 BTUH	20,000 BTUH	36,000 BTUH	24,000 BTUH	36,000 BTUH	36,000 BTUH
EFFICIENCY SEER/EER	23.5/14.52	22.7/12.5	21.5/12.58	21.5/13	––	––	19/12.5	21.5/12.58	––	––	––	––
EFFICIENCY HSPF/COP	11.3/––	11.4/––	10.2/	12/––	––	––	10.2/––	10.2/	––	––	––	––
REFRIGERANT	410 A	410 A	410 A	410 A	410 A	410 A	410 A	410 A	410 A	410 A	410 A	410 A
REFRIGERANT CHARGE	X LBS	X LBS	X LBS	––	X LBS	X LBS	X LBS	X LBS	X LBS	X LBS	X LBS	X LBS
MAX OPERATING TEMPS	115/5	115/5	122/–4	122/–4	122/–4	122/–4	122/–4	122/–4	122/–4	122/–4	122/–4	122/–4
MAX PIPING LENGTH	82 FT	82 FT	115 FT	164 FT	82 FT	82 FT	246 FT	115 FT	115 FT	82 FT	115 FT	115 FT
MAX PIPING HEIGHT	49 FT	32 FT	49 FT	95 FT	49 FT	49 FT	98 FT	49 FT	49 FT	49 FT	49 FT	49 FT
VOLTS–PHASE – **	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE	208/230–1 PHASE
MCA/MOP – **	10/15 AMPS	10/15 AMPS	13/20 AMPS	19/30 AMPS	19/30 AMPS	19/30 AMPS	32/40 AMPS	13/20 AMPS	18/25 AMPS	19/30 AMPS	18/25 AMPS	18/25 AMPS
COMPRESSOR	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED
WEIGHT	85 LBS	80 LBS	135 LBS	150 LBS	135 LBS	135 LBS	175 LBS	135 LBS	135 LBS	135 LBS	135 LBS	135 LBS
BASIS OF DESIGN	LG LSU090HSV5	LG LSU120HSV5	LG LSU180HSV5	LG LSU240HSV5	LG LMU240HHV	LG LMU180HHV	LG LUU360HHV	LG LSU180HSV5	LG LMU36CHV	LG LMU240HHV	LG LMU36CHV	LG LMU36CHV

** – ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

INDOOR UNITS – *

MARK NUMBER	FC-11A 12 MBH	FC-11B 12 MBH	FC-11C 12 MBH	FC-12A 12 MBH	FC-12B 12 MBH	FC-12C 12 MBH
SYSTEM	WEST CORRIDOR			EAST CORRIDOR		
TYPE	WALL MOUNTED			WALL MOUNTED		
EFFICIENCY	SEE OUTDOOR UNIT			SEE OUTDOOR UNIT		
NOMINAL COOLING CAPACITY	12,000 BTUH			12,000 BTUH		
HEATING CAPACITY	12,000 BTUH			12,000 BTUH		
TOTAL SUPPLY CFM	459			459		
OSA CFM	–			–		
EXTERNAL SP. ("H20)	0.25			0.25		
VOLTS/PHASE	–			–		
MCA/MOP	–			–		
WEIGHT	25			25		
BASIS OF DESIGN	LG LSN120HSV5			LG LSN120HSV5		
OUTDOOR UNIT	HP-11 3 TON			HP-12 3 TON		

* – PROVIDE ALL UNITS THAT CANNOT BE DRAINED BY GRAVITY WITH CONDENSATE PUMP, ROUTE ALL CONDENSATE LINES HIDDEN WITHIN STRUCTURE TO AN APPROVED LOCATION PROVIDED BY THE PLUMBER.

ENERGY RECOVERY VENTILATOR – ERV

MARK NUMBER	ERV-1 105 CFM
SYSTEM	DWELLING UNIT
CFM	65/105 CFM
CORE TYPE	MEDIA MEMBRANE
CONTROL	*
HEAT	NONE
VOLTS–PHASE	120/1
AMP RATING	0.9
ESP ("H20)	0.20
EFFICIENCY @64CFM & 95F	68%
WATTS **(HIGH/LOW)	103
WEIGHT	40 LBS
BASIS OF DESIGN	BROAN ** ERVS100S

* PROVIDE VB20W, 20 MINUTE PUSH BUTTON TIMER, PROVIDES HIGH SPEED VENTILATION. UNIT TO RUN AT 65 CFM CONTINUOUS, AND 105 CFM IN BOOST MODE

*** ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

ENERGY RECOVERY VENTILATOR – ERV

MARK NUMBER		ERV-2 1900 CFM	ERV-3 1900 CFM
SYSTEM		WEST CORR.	EAST CORR.
OUTSIDE AIR/SUPPLY AIR		1155	1900
RETURN AIR/EXHAUST AIR		1155	1900
ESP		1.25	1.25
INTAKE FAN MOTOR	VOLTS	208/230	208/230
	PHASE	3	3
	HP	2	2
EXHAUST FAN MOTOR	VOLTS	208/230	208/230
	PHASE	3	3
	HP	2	2
OA/SA TEMP (SUMMER)		92/81	92/81
OA/SA TEMP (WINTER)		22/53	22/53
MCA		27	27
MOCP		35	35
FLA – UNIT ELECTRICAL		24	24
VOLT/PHASE – UNIT ELECTRICAL		208/230–3	208/230–3
WEIGHT		––	––
CONTROLLED BY		––	––
MODEL: ALDES		PE20	PE20

*** – ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS. ELECTRICAL CONTRACTOR RESPONSIBLE FOR SIZING ALL CONDUCTORS & OVERCURRENT PROTECTION. VERIFY WITH EQUIPMENT SUBMITTALS FOR EQUIPMENT ELECTRICAL REQUIREMENTS

EXHAUST FANS

MARK NUMBER	EF 1	EF 2	EF 3	EF 4	EF 5	EF 6
TYPE	CEILING CABINET	CEILING CABINET	CEILING CABINET	CEILING CABINET	CEILING CABINET	CEILING CABINET
SYSTEM	BATHROOM	RESTROOM	JANITOR	TRASH	ELEC	WATER 108
CFM	30/80	110	50	200	100	100
TOTAL SP. (IN H20)	0.20	0.125	0.125	0.125	0.125	0.125
RPM	1062/1146	1190	1250	740	1250	1250
TIP SPEED (FPM)	NA	––	–	––	–	–
MOTOR WATTS OR HP	5/11.7 W	47.3 W	100 W	127 W	100 W	100 W
CONTROLLED BY	**	LIGHTS	CONTINUOUS	HUMIDISTAT	T–STAT	CONTINUOUS
INTERLOCK WITH	MOTION SENSOR	NONE	NONE	NONE	NONE	NONE
FAN SPEED CONTROLLER	YES	NO	NO	YES	NO	NO
WHEEL TYPE	BI	FC	FC	BI	FC	FC
BACK DRAFT DAMPER	YES	GRAVITY	GRAVITY	GRAVITY	GRAVITY	GRAVITY
ISOLATION	RUBBER	RUBBER	RUBBER	RUBBER	RUBBER	RUBBER
DESIGN WEIGHT (LBS)	25	25	25	23	25	25
MAX. SONES	0.3/0.6	3.0	1.5	1.7	1.5	1.5
MAX AMPS – ***	0.27	0.40	1.3	1.8	1.3	1.3
POWER (VOLTS/PHASE/HZ) – ***	120/1/60	120/60/1		120/60/1		
BASIS OF DESIGN:	PANASONIC * FV–05–11VKSL2	BROAN A110	BROAN L100	BROAN L200	BROAN L100	BROAN L100

* – FAN TO INCLUDE 10 WATT DIMMABLE LED CHIP PANEL –COORDINATE SWITCHING WITH ELECTRICAL CONTRACTOR.
** – FAN TO RUN AT LOW SPEED CONTINUOUSLY, AND INCREASE TO HIGH SPEED UPON ACTIVATION OF THE MOTION SENSOR.
***– ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DEIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

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7-25-22

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54,607 PE
OREGON
JULY 11, 2006
MARK R. DENYER
EXPIRES: 31DEC23

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TISTILAL VILLAGE APARTMENTS
7633 N HEREFORD AVENUE
PORTLAND OR

NAYA

PERMIT SET

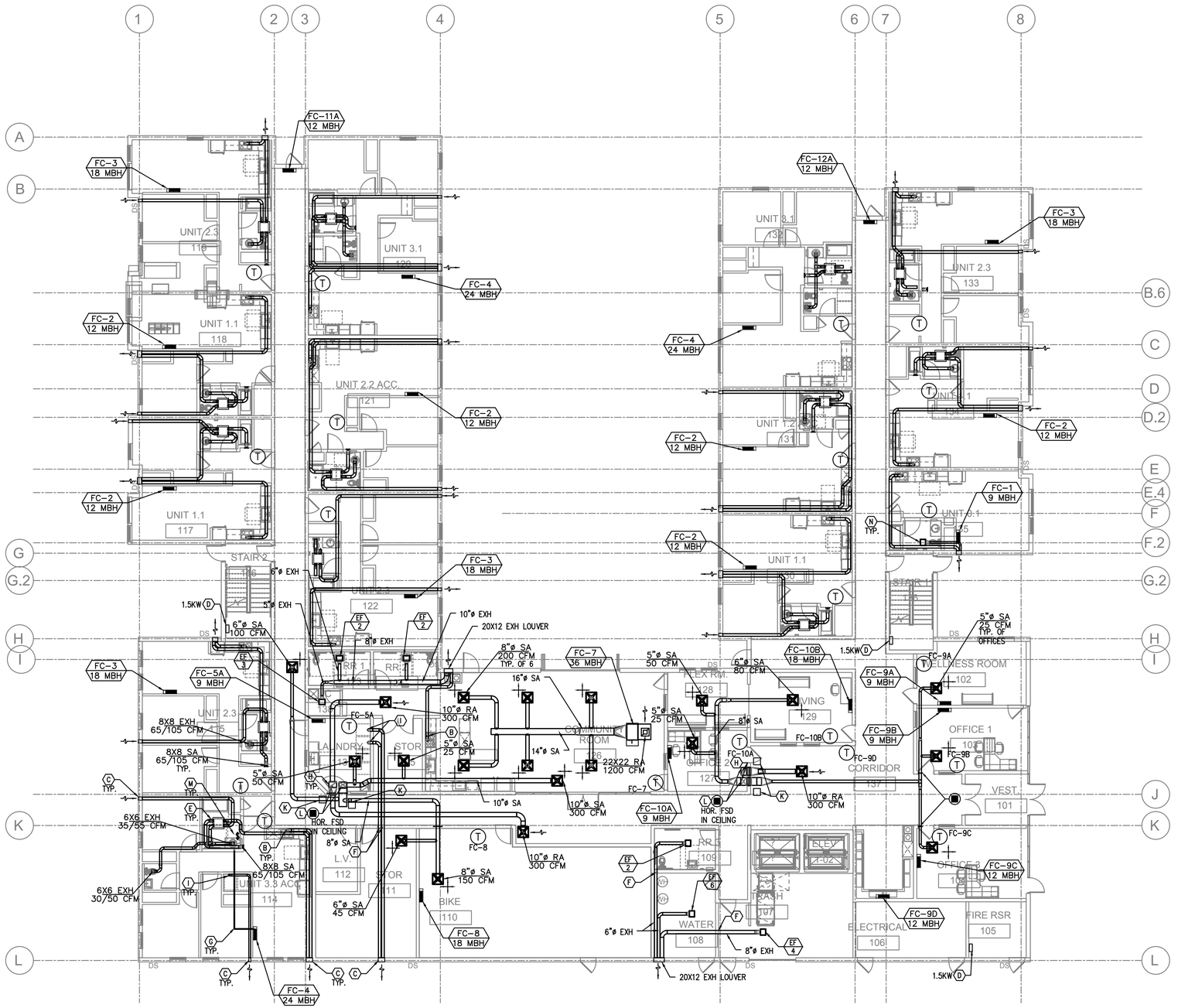
MECHANICAL SCHEDULES

PROJECT NO.
20005

07/25/22

REVISIONS: #

M0.02



1 M1.01 1ST FLOOR – MECHANICAL HVAC
SCALE: 1" = 10'-0"

KEY NOTES:

(A) — REFRIGERANT LINE SETS FROM CONDENSING UNITS ON LEVEL 1/ROOF, TO FAN COILS SEE UNIT NUMBERS AND ROUTING FOR EXACT PLACEMENT.

(B) — 6"ø HOOD DUCT TO ROOF/EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO HOOD. INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. HOOD FAN TO OPERATE INTERMITTENTLY.PER 2019 OMSC 505.3 HOOD DUCTS SHALL HACE SMOOTH INNER WALLS AND SHALL BE AIR TIGHT AND BE EQUIPPED WITH A BACKDRAFT DAMPER.

(C) — EXTERIOR EXHAUST PLENUM – SEE 2/M6.00 MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.

(D) — 1.5KW WALL HEATER QMARK AWH4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.

(E) — ERV DETAILS, SEE 1/M6.02 ERV–1 105 CFM 6" OA, 6" EXH, AND 6" SA DUCTS.

(F) — FIRE PENETRATION DETAILS FOR 4"ø & 6"ø DUCTS, SEE 2/M6.01 2/M6.02

(G) — 3/4" CONDENSATE FROM WALL MOUNTED FAN COIL TO WASHER BOX.

(H) — SUPPLY/RETURN DUCT FROM ERV'S, SEE BELOW

(I) — 4"ø DRYER EXHAUST TO EXTERIOR–ROOF TERMINATION VIA SOFFIT(S) PROVIDED. DRYER DUCT MATERIAL SHALL HAVE A SMOOTH INTERIOR FINISH, BE CONSTRUCTED OF 26 GA SHEET METAL, SUPPORTED AT 4 FOOT INTERVALS, RIVET OR SCREW PENETRATIONS THROUGH THE DUCT WALL ARE NOT ACCEPTABLE. IDENTIFY TOTAL EQUIVALENT LENGTH OF DRYER VENT WITH PERMANENT LABEL WITHIN 6FT OF DRYER CONNECTION. CLEAN–OUT TO BE PROVIDED FOR ALL VERTICAL RISERS. SEE 4/M6.00

(J) — 1.5KW CADET WALL HEATERS FOR LIVING UNITS, 120V. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.

(K) — 16X16 RATED AND LOCKABLE ACCESS HATCH.

(L) — SEE 1/M6.01 FOR TYPICAL F/S INSTALLATION, AND CONTROLS.

(M) — WALL SWITCH FOR ERV BOOSTER.

(N) — PANASONIC WHISPERGREEN CEILING FAN WITH 4"ø DUCT TO ROOF OR EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT DAMPER INTEGRAL TO FAN, FAN TO OPERATE AT LOW SPEED CONTINUOUS (30 CFM) AND INCREASE TO 80 CFM WHEN BUILT–IN MOTION SENSOR IS ACTIVATED. INSULATED FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. SEE EF 1 / 6/M6.00

SHAFT DUCT SIZES					
FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	20 X 20	1900	20 X 20	1900	ERV–1&2
3RD	20 X 20	1900	20 X 20	1900	ERV–1&2
2ND	16 X 18	1500	16 X 18	1500	ERV–1&2
1ST	16 X 14	1100	16 X 14	1100	ERV–1&2

VENTILATION CALCULATIONS:

DWELLING UNITS >500SQFT ARE VENTILATED BY MECHANICAL VENTILATION – ERV'S, DWELLING UNITS <500SQFT ARE VENTILATED BY NATURAL VENTILATION.

COMMON SPACES AND HALLWAYS ARE VENTILATED BY ERV'S SIZED TO EXCEED THE MINIMUM 0.06 CFM/SQ FT REQUIREMENT.

SEE VENTILATION SCHEDULES FOR OTHER UNITS.

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PERMIT SET

1ST FLOOR -
MECHANICAL HVAC

PROJECT NO.
20005

07/25/22

REVISIONS: 1

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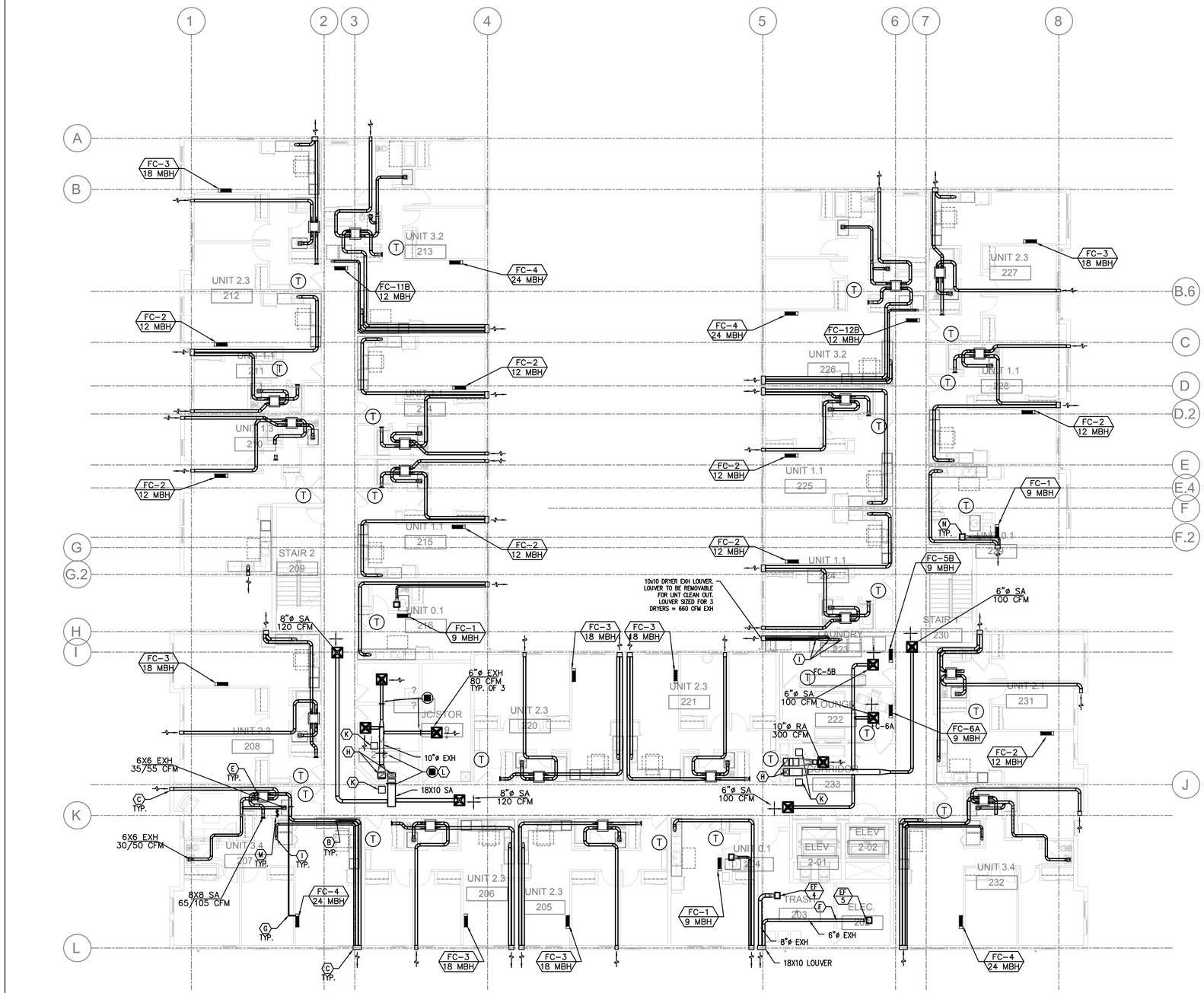
M1.01



1 M202 MECH FLOOR PLAN – LEVEL 2
SCALE: 1" = 10'-0"

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2ND FLOOR -
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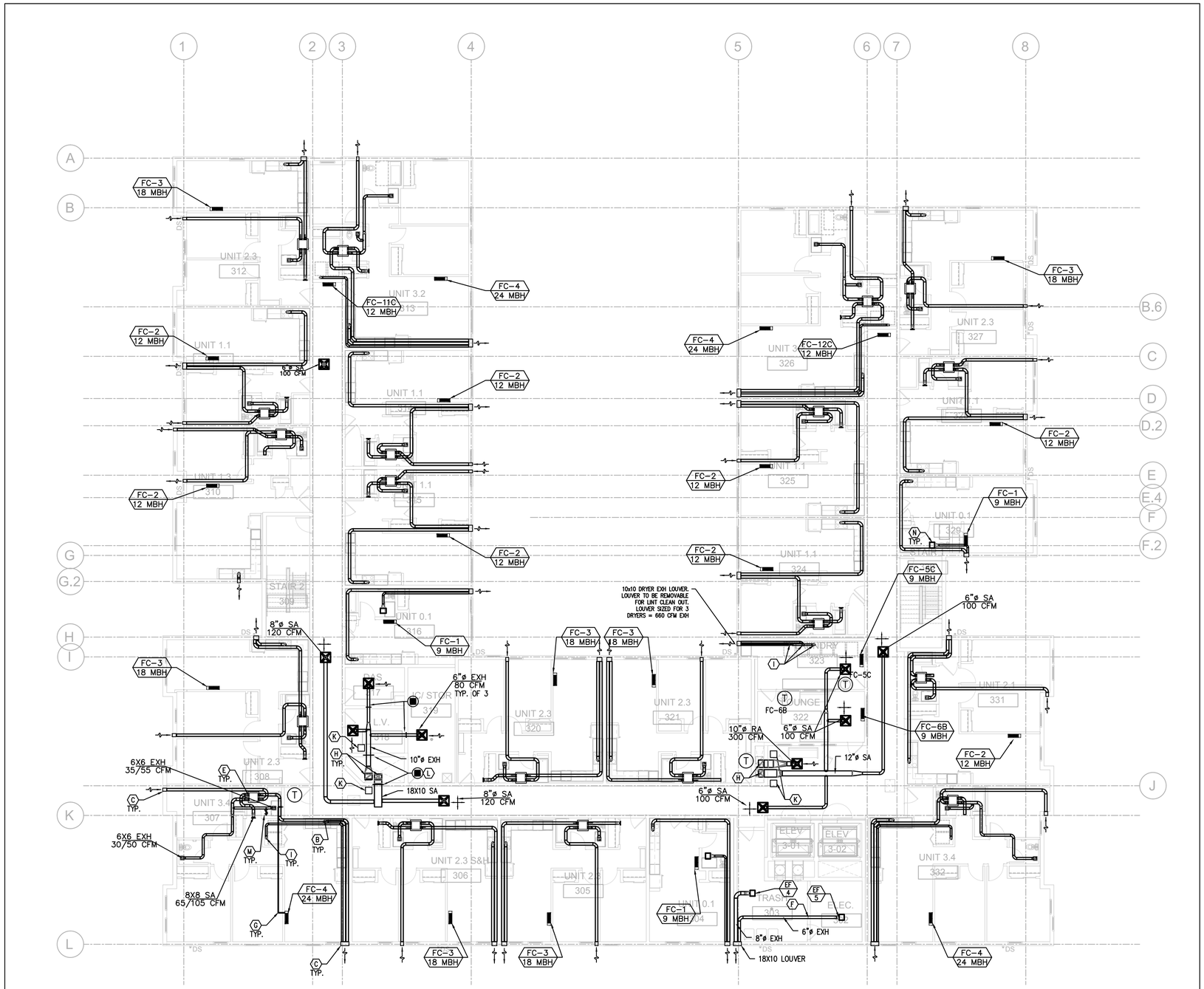
M1.02



1 M203 MECH FLOOR PLAN – LEVEL 3
SCALE: 1" = 10'-0"

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3RD FLOOR -
MECHANICAL HVAC

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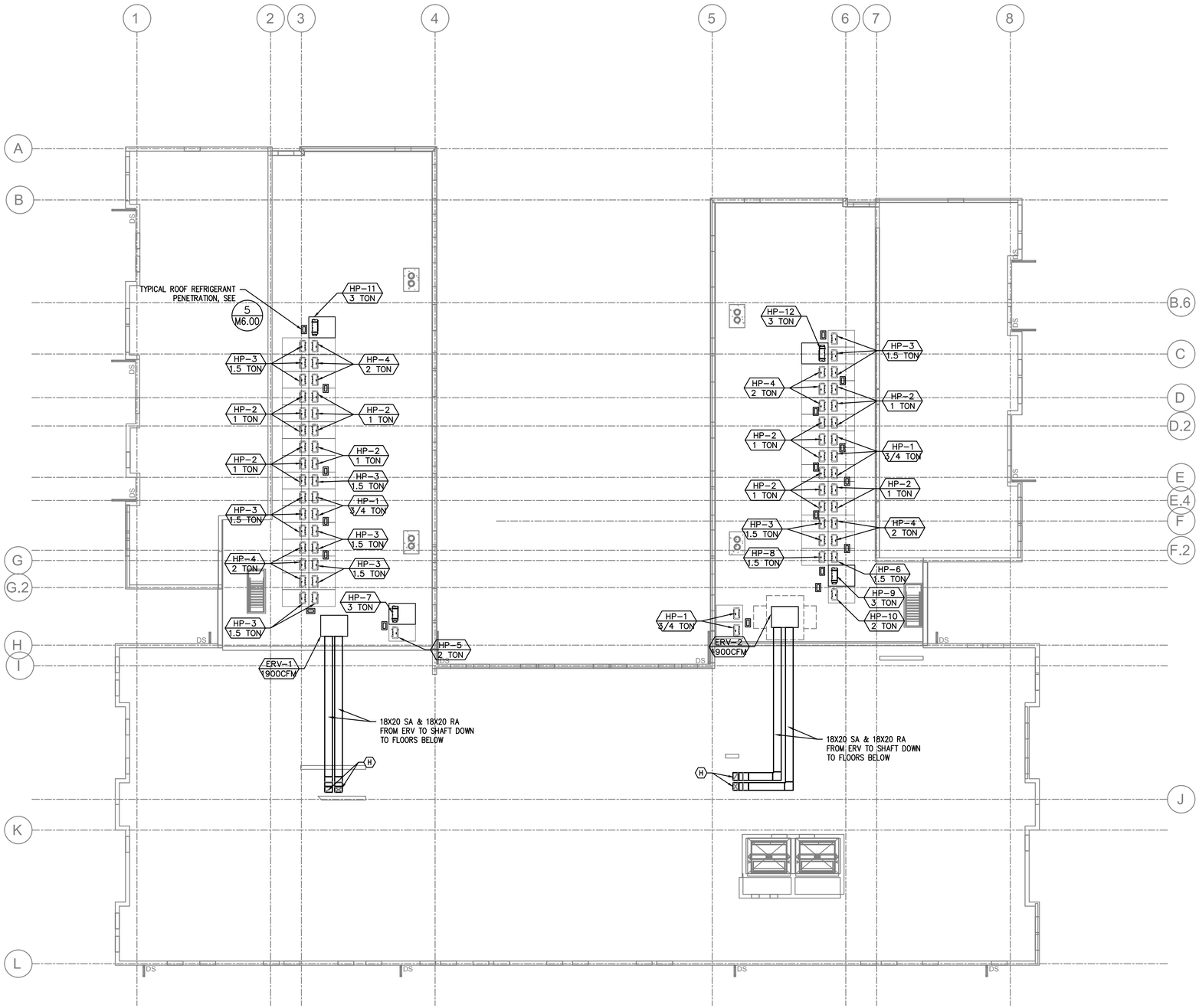
M1.03



1 M204 MECH FLOOR PLAN – ROOF
SCALE: 1" = 10'-0"

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ROOF - MECHANICAL
HVAC

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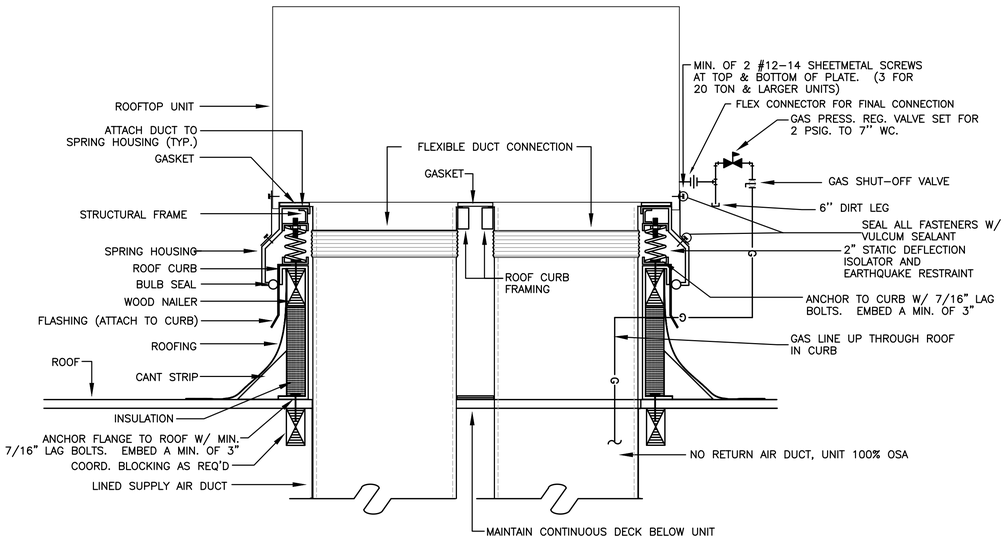
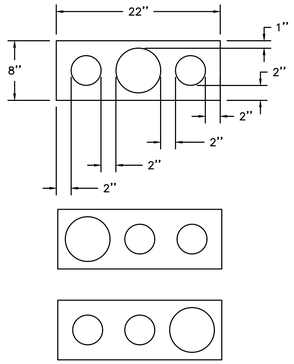
M1.04



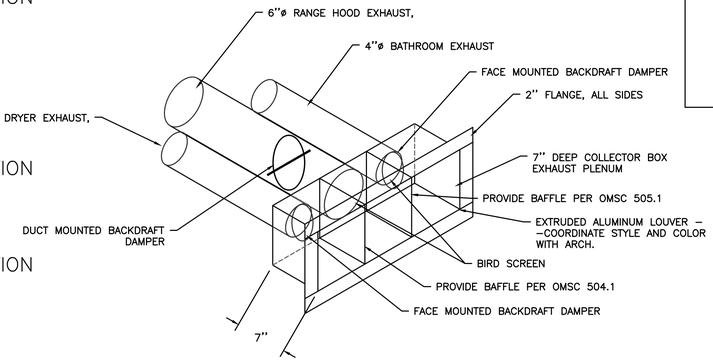
1 M6.00 ROOF TOP UNIT W/ VIBRATION ISOLATION CURB
SCALE: DETAIL



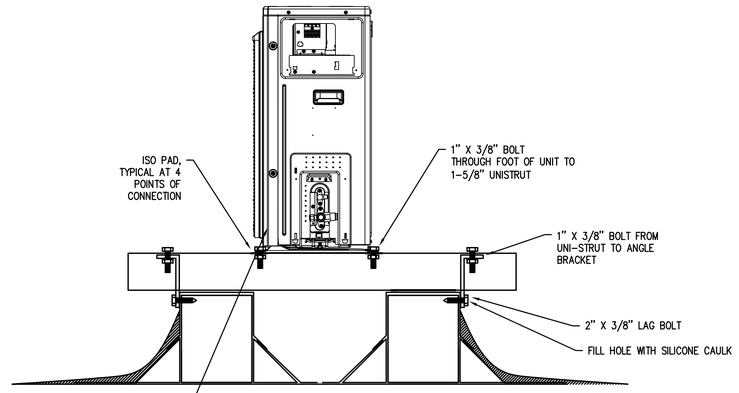
4-6-4 CONFIGURATION

6-4-4 CONFIGURATION

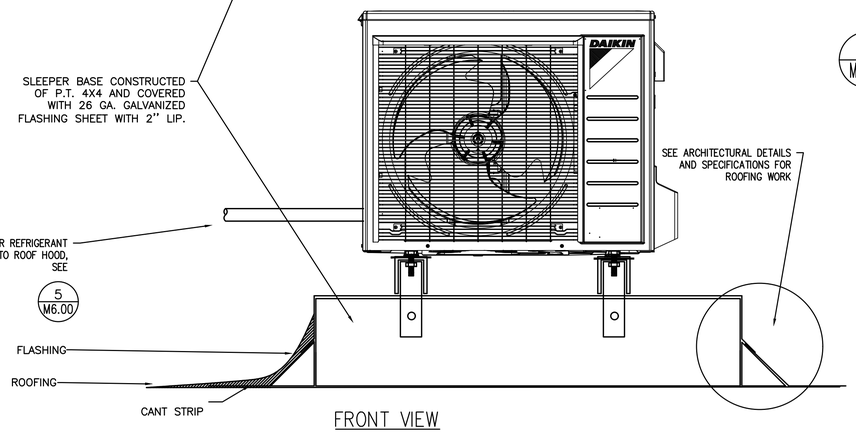
4-4-6 CONFIGURATION



2 M6.00 SIDE WALL DWELLING UNIT VENTING
NOT TO SCALE

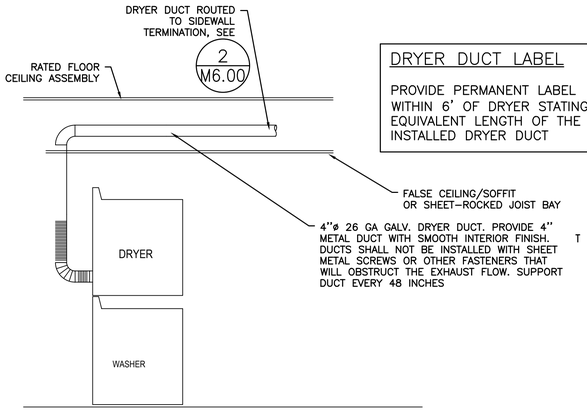


END VIEW



FRONT VIEW

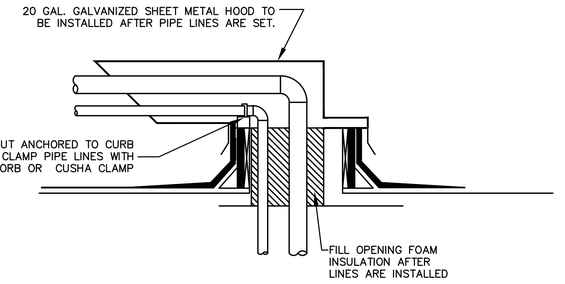
3 M6.00 HEAT PUMP CURB
DETAIL



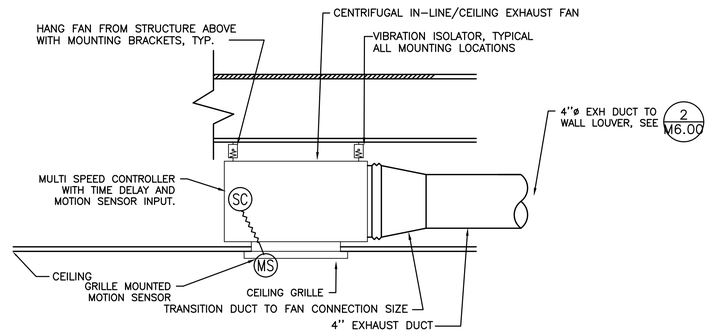
4 M6.00 TYPICAL DRYER INSTALLATION
NOT TO SCALE

DRYER DUCT LABEL

PROVIDE PERMANENT LABEL WITHIN 6' OF DRYER STATING THE EQUIVALENT LENGTH OF THE INSTALLED DRYER DUCT



5 M6.00 REFRIGERANT ROOF PENETRATIONS
DETAIL



6 M6.00 RESTROOM EXHAUST FAN
SCALE: DETAIL

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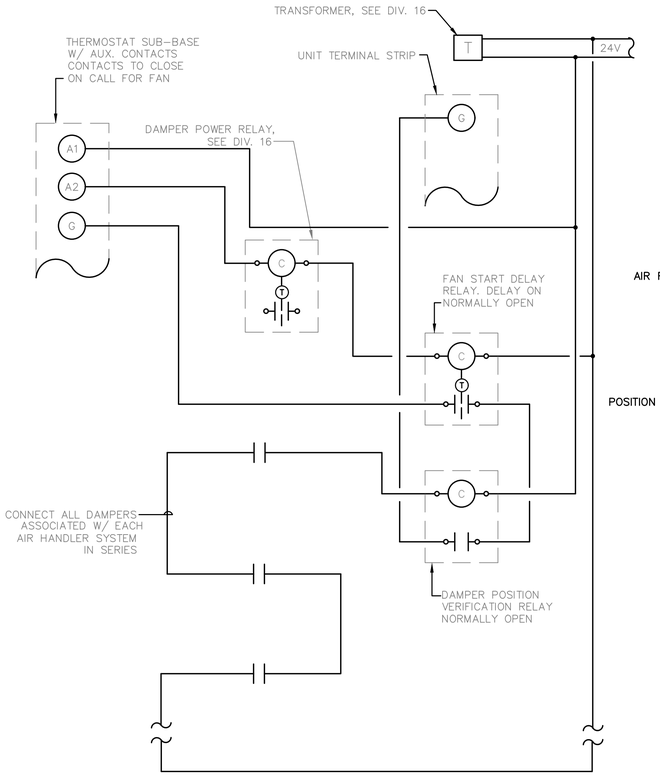
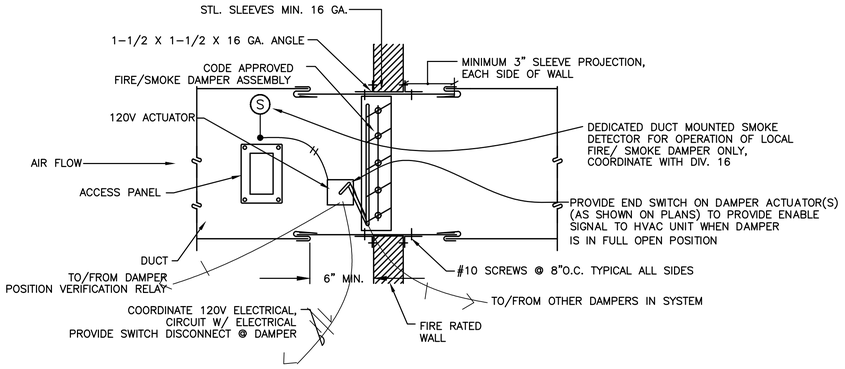
REVISIONS: A

M6.00





1 / M6.01 FIRE/SMOKE DAMPER W/SMOKE DETECTOR
NOT TO SCALE

NOTE:

PROVIDE ALL REQUIRED CONTROL WIRING TO ACCOMPLISH:

FIRE/SMOKE DAMPER – FIRE/SMOKE DAMPER TO CLOSE UPON ACTIVATION OF LOCAL SMOKE DETECTOR

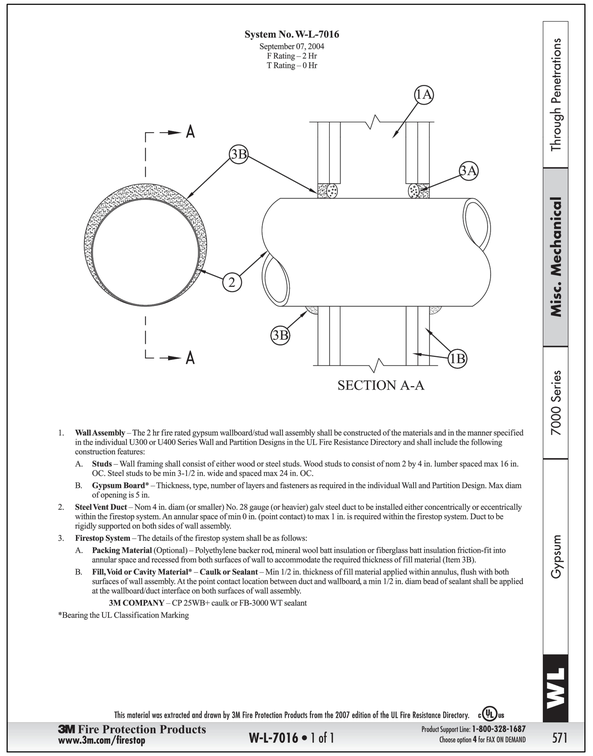
EXHAUST DUCTS/FANS – FIRE/SMOKE DAMPER TO CLOSE UPON SHUTDOWN OF ASSOCIATED EXHAUST FAN.

SUPPLY OR RETURN DUCTS/FANS – FIRE/SMOKE DAMPER TO CLOSE UPON SHUTDOWN OF ASSOCIATED AIR HANDLING UNIT.

GENERAL NOTES:

PROVIDE ACCESS IN CEILING OR WALL FOR DAMPER AND SMOKE DETECTOR

SEE ELECTRICAL DRAWINGS FOR WIRING INSTALLATION



2 / M6.01 FIRE PENETRATION DETAIL – 4'' DUCTS
DETAIL

VENTILATION AIR SCHEDULE - ERV-1 --- 1ST FLOOR

ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)		ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az		Pz	Rp	Ra	Vbz	Ez	Voz	Vpz	Zp			Evz		
LAUNDRY 113	160	15	3	5	0.18	44	1.0	44	50	0.88	0	0	1.00	44.76	ERV-1
CORRIDOR WEST 1ST FLOOR	1285	0	0	0	0.06	77	1.0	77	100	0.77	300	0	1.10	78.79	ERV-1
STOR 125	133	0	0	0	0.12	16	1.0	16	25	0.64	0	0	1.24	16.31	ERV-1
STOR 111	373	0	0	0	0.12	45	1.0	45	50	0.90	0	0	0.98	45.74	ERV-1
BIKE 110	1016	0	0	0	0.12	122	1.0	122	150	0.81	0	0	1.06	124.59	ERV-1
COMMUNITY ROOM 126	1118	15	17	5	0.18	286	1.0	286	300	0.95	300	0	0.92	292.51	ERV-1
TOTAL	**4085**		**20**			**590**		**590**	**675**		**600**	**0**	**0.98**	**603**	
								Vou	**Vps**				**Ev**		
					CORRECTED TOTAL OUTDOOR AIR FLOW RATE					**603**	**CFM**		**Corrected OSA Fractio**	**Zs =**	**0.89**	

VENTILATION AIR SCHEDULE - ERV-1 --- 2ND & 3RD FLOOR

ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)		ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az		Pz	Rp	Ra	Vbz	Ez	Voz	Vpz	Zp			Evz		
CORRIDORS	1126	0	0	0	0.06	68	1.0	68	240	0.28	0	0	1.00	67.56	ERV-1
DAS X17	105											80			ERV-1
LV X18	105											80			ERV-1
JC/STOR X19	223											80			ERV-1
TOTAL	**1559**		**0**			**68**		**68**	**240**		**0**	**240**	**1.00**	**68**	
								Vou	**Vps**				**Ev**		
					CORRECTED TOTAL OUTDOOR AIR FLOW RATE					**68**	**CFM**		**Corrected OSA Fractio**	**Zs =**	**0.28**	

VENTILATION AIR SCHEDULE - ERV-2 --- 1ST FLOOR

ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)		ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az		Pz	Rp	Ra	Vbz	Ez	Voz	Vpz	Zp			Evz		
CORRIDOR EAST	1587	0	0	0	0.06	95	1.0	95	100	0.95	300	0	0.98	103.52	ERV-2
FLEX RM 128	162	30	5	7.5	0.06	47	1.0	47	50	0.94	0	0	0.99	51.34	ERV-2
LIVING 129	263	30	8	7.5	0.06	76	1.0	76	80	0.95	0	0	0.98	82.38	ERV-2
OFFICE 2 127	180	5	1	5	0.06	16	1.0	16	25	0.63	0	0	1.30	17.18	ERV-2
WELLNESS ROOM 102	247	5	2	5	0.06	25	1.0	25	25	0.99	0	0	0.94	26.98	ERV-2
OFFICE 1 103	254	5	2	5	0.06	25	1.0	25	25	1.01	0	0	0.92	27.44	ERV-2
OFFICE 3 104	288	5	2	5	0.06	27	1.0	27	30	0.91	0	0	1.02	29.66	ERV-2
TOTAL	**2981**		**20**			**311**		**311**	**335**		**300**	**0**	**0.92**	**338**	
								Vou	**Vps**				**Ev**		
					CORRECTED TOTAL OUTDOOR AIR FLOW RATE					**338**	**CFM**		**Corrected OSA Fractio**	**Zs =**	**1.01**	

VENTILATION AIR SCHEDULE - ERV-2 --- 2ND &3RD FLOOR

ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ FT.)	OUTSIDE AIR REQUIRED (CFM)		ZONE OSA (CFM)	SUPPLY AIR (CFM)	PRIMARY OSA FRACTION	RETURN AIR (CFM)	EXHAUST AIR (CFM)	Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
	Az		Pz	Rp	Ra	Vbz	Ez	Voz	Vpz	Zp			Evz		
CORRIDOR EAST	1000	0	0	0	0.06	60	1.0	60	200	0.30	300	0	1.10	80.96	ERV-2
LAUNDRY 223	235	15	4	5	0.06	34	1.0	34	100	0.34	0	0	1.06	46.01	ERV-2
LOUNGE 222	223	30	7	7.5	0.06	66	1.0	66	100	0.66	0	0	0.74	88.89	ERV-2
TOTAL	**1458**		**11**			**160**		**160**	**400**		**300**	**0**	**0.74**	**216**	
								Vou	**Vps**				**Ev**		
					CORRECTED TOTAL OUTDOOR AIR FLOW RATE					**216**	**CFM**		**Corrected OSA Fractio**	**Zs =**	**0.54**	

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MECHANICAL DETAILS

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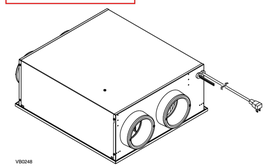
M6.01

BROAN

BROAN™ ERVS100
Part no. ERVS100S
65-105 CFM (0.4 in. w.g.)



THE FRESH AIR SOLUTION FOR SOUTHERN REGIONS

The Broan ERVS100 is an effective, balanced ventilation solution designed specifically for homes in southern regions. The ERVS100 provides a continuous supply of fresh air to the home while exhausting stale air and polluants. Plus it manages excess moisture – making it a centerpiece for tightly-constructed, energy efficient homes in hot and humid or dry climates.

- 65 to 105 CFM at 0.4 in. w.g;
- Energy recovery core recovering up to 51% of the excess moisture and up to 71% of the apparent heat or coolness;
- Built-in humidity sensor limiting the ventilation during periods of excessive outdoor humidity levels contributes to maintain a comfortable living area and mitigate the risks of mold growth;
- Exclusive bracket system providing a faster and easier installation in the ceiling, an attic or in a closet. See the Installation and User guide for more details;
- Integrates with existing forced-air furnace ducting for easy installation but runs independently to limit energy consumption related to ventilation;
- Built-in damper on fresh air supply port to prevent outdoor air infiltration when the unit is turned off;
- Integrated control to easily set the unit at installation.

REPAIRS AND MAINTENANCE

All parts requiring maintenance can be removed in less than 5 minutes allowing easy access for repairs. The PSC motors are permanently lubricated.

WARRANTY

The BROAN™ ERVS100 is protected by a 5-year warranty on parts only. The energy recovery core is covered by a 5-year warranty, with the original proof of purchase.

Product balancing

The ERVS100 is equipped with 2 high static pressure blowers and is factory balanced. Once installed, the ERVS100 will remain balanced (within a 10% total difference between the exhaust and supply airflows) when the static pressure difference between the exhaust and the supply remains below 0.2 in. w.g.
No balancing dampers are required when this condition is met.

Filters

- 2 washable filters, 20 PPI
- MERV 8 optional filters, part V21030.

Defrosting system

Unit performs a negative defrost during 10 minutes every 20 minutes when outdoor temperature is below 14°F, and 10 minutes every 10 minutes below -4°F.

Energy Recovery Core

Material: Polymerized paper
Type: Cross flow
Warranty: 5 years

Options

- Broan VTYIK1 Tandem transition (requires an additional backdraft damper, not included)
- Broan VB20W 20-minute push-button control
- Broan 69V Single-Function Control, Ivory (Dry contact standby switch)
- Broan 69W Single-Function Control, White (Dry contact standby switch)
- Broan 634M black exhaust roof cap 6" with backdraft damper and bird screen
- Broan 843BL black exhaust wall cap 6" with backdraft damper and bird screen
- Broan 641 aluminum exhaust wall cap 6"
- Broan 641FA aluminum inlet wall cap 6" with bird screen
- Broan CVG6 interior inlet plastic grille 6"
- Broan CVL6 mounting sleeve for inlet grille CVG6
- Broan CVLD6 sleeve with 6" backdraft damper

Requirements and standards

- Complies with the UL 1812 requirements regulating the installation of Energy Recovery Ventilators;
- HVI certified;
- Airflow and energy recovery performance tested in accordance with CSA C439 standard.

Noise level
0.4 sone @ 105 cfm at grille with 5' of flexible ducting (tested in accordance with ISO 5136 and HVI 915).

Specifications

Model : Broan ERVS100

Part number: ERVS100S

Total assembled weight including packaging: 40 lb.

Insulated round ports: 6" diameter

Built-in magnetic backdraft damper to close outdoor fresh air supply when the unit is turned off

Energy recovery core:
-Type cross flow
-Media membrane: Polymerized paper with aluminum

Core filters: 2 washable filters 20 PPI
Optional MERV 8 filter kit, part no. V21030

Housing material: galvanized steel 22 ga

Door and door frame material: White pre-painted steel 20 ga

Insulation material: Molded Expanded polystyrene, UL certified for Energy recovery ventilators requirements

Supply and exhaust blower motors:
-PSC motors
-Protection type: Thermally protected
-Lock rotor electronic detection stops unit if motors failed

Installation brackets: included with the unit, allow attic, flush to ceiling and under-ceiling installations. Unit must be installed with the door facing upward or downward. No vertical installation allowed.

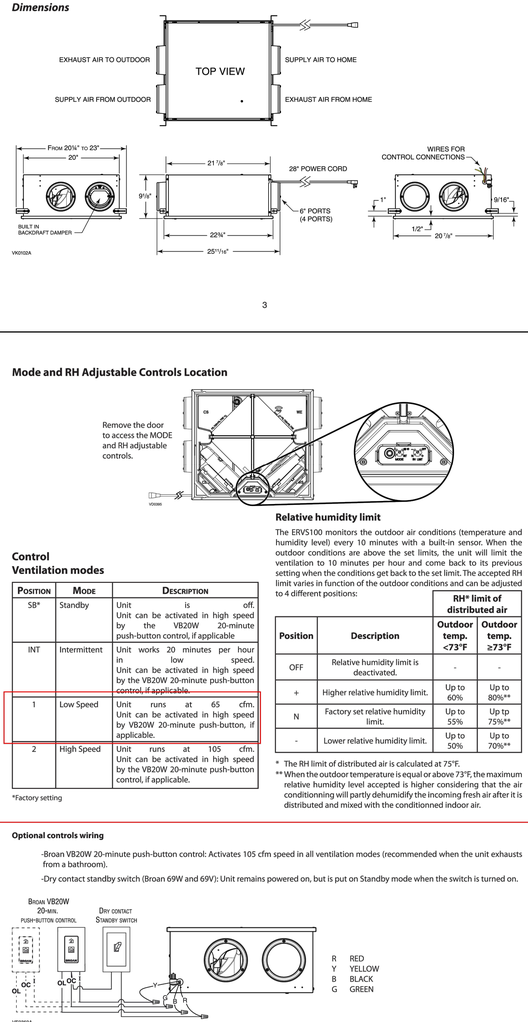
Unit electrical characteristics

-Power cord 28" with 3-prong plug

Volts	Frequency	Ampere	Watts
120	60 hz	0.9	103

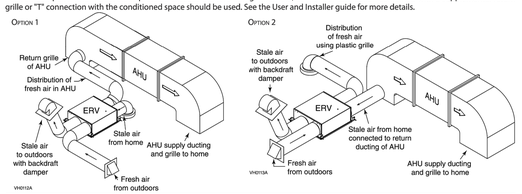
Low voltage connections for optional controls energized by unit

Dimensions



Combining with an AHU

Recommended configurations
Option 1 - When the distribution of fresh air from the ERV is connected to the return of an AHU (such as in the image below, on the left), static pressure where the fresh air from the ERV enters the AHU return ducting must be below 0.15 in.w.g. to ensure proper functionning of the built-in fresh air damper. If return duct static pressure exceeds the 0.15 in.w.g. threshold, an indirect connection combined with a supplemental return grille or "T" connection with the conditioned space should be used. See the User and Installer guide for more details.

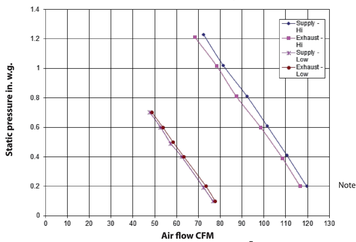


Energy performance ERVS100

Supply Temperature		Net Air Flow	Power Consumed	Sensible Recovery Efficiency	Adjusted Sensible Recovery Efficiency	Apparent Sensible Effectiveness*	Latent Recovery/ Moisture Transfer	Total Recovery Efficiency	Adjusted Total Recovery Efficiency
	°F	CFM	Watts	%	%	%	%	%	
Cooling	95	64	46			62	45	48	51
	95	106	103			55	35	38	41
Heating	32	64	46	64	68	71	51		
	32	106	103	57	63	67	42		

Data not certified by HVI.
NOTE: All specifications are subject to change without notice.

Ventilation performance



Note: In high speed, account for an increase in static pressure of proximately 0.2 in. w.g. when installed with the Broan VTYIK1 Tandem transition, depending on installation.

Mode and RH Adjustable Controls Location

Control
Ventilation modes

Position	Mode	Description
SB*	Standby	Unit is off. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable
INT	Intermittent	Unit works 20 minutes per hour in low speed. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable.
1	Low Speed	Unit runs at 65 cfm. Unit can be activated in high speed by VB20W 20-minute push-button, if applicable.
2	High Speed	Unit runs at 105 cfm. Unit can be activated in high speed by the VB20W 20-minute push-button control, if applicable.

*Factory setting

Relative humidity limit

The ERVS100 monitors the outdoor air conditions (temperature and humidity level) every 10 minutes with a built-in sensor. When the outdoor conditions are above the set limits, the unit will limit the ventilation to 10 minutes per hour and come back to its previous setting when the conditions get back to the set limit. The accepted RH limit varies in function of the outdoor conditions and can be adjusted to 4 different positions:

Position	Description	RH* limit of distributed air: Outdoor temp. <73°F	Outdoor temp. ≥73°F
OFF	Relative humidity limit is deactivated.	-	-
+	Higher relative humidity limit.	Up to 60%	Up to 80%**
N	Factory set relative humidity limit.	Up to 55%	Up tp 75%**
-	Lower relative humidity limit.	Up to 50%	Up to 70%**

* The RH limit of distributed air is calculated at 75°F.
** When the outdoor temperature is equal or above 73°F, the maximum relative humidity level accepted is higher considering that the air conditionning will partly dehumidify the incoming fresh air after it is distributed and mixed with the conditionned indoor air.

Optional controls wiring

-Broan VB20W 20-minute push-button control: Activates 105 cfm speed in all ventilation modes (recommended when the unit exhausts from a bathroom).

-Dry contact standby switch (Broan 69W and 69V): Unit remains powered on, but is put on Standby mode when the switch is turned on.

This connection allows the operation of VB20W push-button controls even if the dry contact standby switch is turned off.

ERVS100d210406

EQUIPMENT CAPACITY VERIFICATION

THE ERV IS RATED FOR 105 CFM AT 0.4" OF STATIC – DESIGN CONDITION OF WORST CASE UNIT IS 0.372"(HIGH SPEED) & 0.216" (LOW SPEED). MINIMUM REQUIRED VENTILATION FOR THE TWO BEDROOM UNIT IS 60 CFM AND A ONE BEDROOM IS 45 CFM.

MINIMUM EXH CFM FOR A 1 BATHROOM UNIT IS 45 CFM AND A TWO BATHROOM UNIT IS 65 CFM. THE ERV FOR ALL UNITS WILL OPERATE AT 65 CFM CONTINUOUS AND BOOST TO 105 CFM WITH WALL SWITCH (20 MINUTE TIMER).

FULL SIZE INTEGRAL ACCESS PANEL FOR ERV S-100 UNIT ACCESS DOOR IS ALSO CEILING ACCESS PANEL. UNIT INSTALLED IN A NON-RATED CEILING. ACCESS DOOR CONTAINS FAN CUT-OFF SWITCH (FAN DISCONNECT) TO ALLOW SERVICE OF ERV.

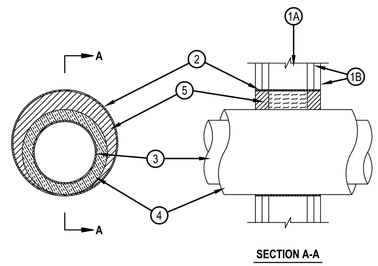
1 / M6.02 ERV SUBMITTAL/DETAILS
NOT TO SCALE

CLASSIFIED C UL US
Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

System No. W-L-7018

WL 7018

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/2 Hr	FT Rating — 1-1/2 Hr
	FH Rating — 2 Hr
	FTH Rating — 1-1/2 Hr



SECTION A-A

1. Wall Assembly — The 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.
   B. Gypsum Board* — Two layers of nom 5/8 in. (16 mm) thick gypsum wallboard as specified in the individual Wall and Partition Design No. Max diam of opening is 9 in. (229 mm).
2. Metallic Sleeve — Cylindrical sleeve fabricated from min 0.016 in. (0.40 mm) thick (No. 28 gauge) galv steel sheet steel and having a min 2 in. (51 mm) lap along the longitudinal seam. Length of sleeve to be 1/8 in. (3 mm) less than thickness of wall. Sleeve to be installed by coiling the sheet metal to a diam smaller than the through opening, inserting the coil through the openings and releasing the coil to let it uncoil against the circular cutouts in the gypsum wallboard layers.

HILTI Hilti Firestop Systems

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System No. W-L-7018

WL 7018

3. Steel Duct — Nom 6 in. (152 mm) diam (or smaller) No. 28 gauge (or heavier) galv steel duct to be installed concentrically within the firestop system. Duct to be rigidly supported on both sides of the wall assembly.
4. Pipe Covering* — Nom 1 in. (25 mm) thick hollow cylindrical heavy density (3.5 pcf or 56 kg/m3) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Tranverse joints secured with metal fasteners or with butt tape supplied with the product. The annular space between the insulated pipe and the steel sleeve shall be min 0 in. (point contact) to max 1 in. (25 mm).
   See Pipe Equipment Covering — Materials — (BRGU) Category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
5. Fill, Void or Cavity Material* — Sealant — Min 1-1/4 in. (32 mm) depth of sealant applied within the annulus, flush with each surface of the wall assembly. At the point contact location between insulated pipe and wall, a min 1/2 in. (13 mm) diam bead of sealant shall be applied on both surfaces of wall, lapping 1/4 in. (6 mm) beyond the periphery of the opening.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

HILTI Hilti Firestop Systems

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2 / M6.02 FIRE PENETRATION DETAIL – 5'' or 6'' DUCTS
DETAIL

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Portland, OR 97214
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FAX: (503) 234-0677
INC. WWW.MFIA-ENG.COM
CONTACT: MARK DENYER

JACOBS

7-25-22

REGISTERED PROFESSIONAL ENGINEER
54,607
OREGON
JULY 11, 2005
MARK R. DENYER
EXPIRES: 31DEC23

PRELIMINARY
NOT FOR CONSTRUCTION

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MECHANICAL DETAILS

PROJECT NO.
20005

07/25/22

REVISIONS: #

M6.02