

H.V.A.C. NOTES

HVAC GENERAL NOTES

- ALL MECHANICAL EQUIPMENT AND INSTALLATIONS SHALL CONFORM WITH THE REQUIREMENTS OF THE 2009 INTERNATIONAL MECHANICAL CODE, THE 2009 INTERNATIONAL BUILDING CODE, THE 2009 INTERNATIONAL ENERGY CODE, STATE AMENDMENTS, NFPA 90A, 101, UNDERWRITERS LABORATORIES (OR ETL), AND ALL APPLICABLE LOCAL CODES AND ORDINANCES.
- PRIOR TO PURCHASING ANY MATERIALS OR STARTING ANY WORK, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DUCTWORK SIZES AND LOCATIONS, EQUIPMENT, ETC. SHOWN ON THE DRAWINGS OR AFFECTING THIS WORK AND SHALL REPORT ANY DEVIATIONS TO THE ARCHITECT.
- SHOP DRAWINGS SHALL BE SUBMITTED TO AND APPROVED BY THE ARCHITECT PRIOR TO ORDERING, PURCHASING, OR FABRICATING ANY MECHANICAL EQUIPMENT. SHOP DRAWINGS SHALL INCLUDE: ALL EQUIPMENT SCHEDULED OR SPECIFIED ON THE DRAWINGS; DUCTWORK DRAWN TO 1/4" SCALE OR THE SCALE SHOWN ON THE DRAWINGS; REFRIGERANT PIPING AND CONTROL WIRING SCHEMATICS CERTIFIED BY THE AIR CONDITIONING EQUIPMENT MANUFACTURER. FAILURE TO SUBMIT REFRIGERANT PIPING DRAWINGS SHALL BE CAUSE FOR REJECTION OF THE ENTIRE SUBMITTAL. LONG LINE REFRIGERANT PIPING APPLICATIONS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S CURRENT SPLIT SYSTEM LONG-LINE APPLICATION GUIDELINE.
- ALL MECHANICAL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- ALL MECHANICAL EQUIPMENT AND SYSTEMS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR AFTER ACCEPTANCE BY OWNER.
- ALL HVAC COMPRESSORS SHALL HAVE EXTENDED 4 YEAR MANUFACTURER'S WARRANTY FOR A 5-YEAR TOTAL WARRANTY.
- FOR EXACT LOCATION OF OUTDOOR AIR CONDITIONING UNITS, SEE ARCHITECTURAL DRAWINGS.
- INSTALL ROOF MOUNTED OUTDOOR AIR CONDITIONING EQUIPMENT LEVEL ON CURB (BY OTHERS), MOUNT ALL EQUIPMENT ON NEOPRENE PADS. ALL ROOFTOP MOUNTED EQUIPMENT SHALL BE INSTALLED PER DETAILS AND AS RECOMMENDED BY THE MANUFACTURER.
- MOUNT TOP OF THERMOSTATS AND HUMIDISTAT SENSORS 46" AFF UNLESS NOTED OTHERWISE. PROVIDE CLEAR LOCKING GUARD ASSEMBLIES FOR ALL PUBLIC AREA THERMOSTATS. COORDINATE THERMOSTAT LOCATIONS WITH OTHER TRADES. ALL THERMOSTATS SHALL BE ADA COMPLIANT.
- ALL WORK SHALL BE COORDINATED AND PERFORMED WITH PRIOR APPROVAL FROM THE OWNER TO SUIT HIS OPERATING CONDITIONS.
- AFTER CONSTRUCTION, THE ENTIRE HVAC SYSTEM SHALL BE CLEANED, TESTED AND ADJUSTED TO SATISFY EQUIPMENT SCHEDULE. DWELLING LIVING UNITS AND CLUB AREAS SHALL NOT REQUIRE AN AIR TEST AND BALANCE BE PERFORMED.
- CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL EQUIPMENT, DUCTWORK, PIPING, ETC. TO FIT WITHIN THE SPACE ALLOWED BY THE ARCHITECTURAL AND STRUCTURAL CONDITIONS. CUTTING OR OTHERWISE ALTERING ANY STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT.
- ALL PIPE AND DUCT PENETRATIONS OF FIRE AND/OR SMOKE-RATED ASSEMBLIES SHALL BE FIRE-STOPPED AS REQUIRED TO RESTORE THE ASSEMBLY TO ITS ORIGINAL INTEGRITY. FIRE BARRIER PRODUCTS SHALL BE AS MANUFACTURED BY TREMCO, HILTI, 3M OR APPROVED EQUAL.
- MANUAL OVER-RIDE CONTROL (EMERGENCY SHUT-DOWN) SWITCHES FOR ALL HVAC UNITS SHALL BE LOCATED IN LOCKING COVER ADJACENT TO FIRE ALARM ANNUNCIATOR PANEL OR OTHER LOCATION APPROVED BY LOCAL AUTHORITY HAVING JURISDICTION AND PER NFPA 92A.
- PROVIDE ACCESS PANELS IN NON-ACCESSIBLE CEILINGS AND IN WALL STRUCTURE TO ALLOW ADEQUATE ROOM FOR MAINTENANCE OF EQUIPMENT AND BALANCING OF SYSTEMS. ACCESS PANELS IN CEILING AND WALLS SHALL BE PROVIDED WHERE SHOWN ON THE DRAWINGS OR NECESSARY TO ACCESS DAMPERS, VALVES, ETC. COORDINATE EXACT LOCATION OF ALL ACCESS PANELS WITH THE ARCHITECT DURING THE SHOP DRAWING PROCESS.
- ALL MECHANICAL EQUIPMENT SHALL BE LABELED WITH A SEMI-RIGID PLASTIC LAMINATE NAMEPLATE WITH 2" HIGH WHITE LETTERS ON A BLACK BACKGROUND SECURELY AFFIXED TO THE EQUIPMENT. THE NAMEPLATE SHALL SHOW THE EQUIPMENT TAG USED ON THESE DRAWINGS. ON RESIDENTIAL PROJECTS, THE NAMEPLATE ON THE OUTDOOR EQUIPMENT SHALL INDICATE THE APARTMENT UNIT NUMBER IT SERVES AS WELL AS THE EQUIPMENT ID TAG.
- REFER TO ARCHITECTURAL PLANS FOR ALL FURDOWN CEILING AREAS.
- PANCAKE STYLE AIR HANDLERS LOCATED ABOVE TOILET AREAS SHALL BE INSTALLED IN A MINIMUM 14-INCH DEEP INSIDE CLEAR FURDOWN RETURN AIR PLENUM, REFERENCE ARCHITECTURAL PLANS.
- REFER TO ARCHITECTURAL PLANS FOR FLOOR AND CEILING ASSEMBLY UL RATINGS AND DETAILS.
- GENERAL CONTRACTOR SHALL COORDINATE THE INSTALLATION OF WOOD TRUSS SHOP DRAWINGS AND FIELD TRUSSES TO AVOID WOOD TRUSSES CONFLICTING WITH VERTICAL SHAFTS AND INDIVIDUAL AIR HANDLING UNIT DISCHARGE PLENUMS.

MECHANICAL/ELECTRICAL COORDINATION:

- CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH ELECTRICAL DRAWINGS PRIOR TO ORDERING EQUIPMENT OR SUBMITTING SHOP DRAWINGS, AND SHALL FURNISH EQUIPMENT WIRED FOR THE VOLTAGES SHOWN THEREIN. SHOP DRAWING SUBMITTALS SHALL CLEARLY STATE THAT THE ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT HAS BEEN COORDINATED WITH THE ELECTRICAL CONTRACTOR DOCUMENTS AND THE ELECTRICAL CONTRACTOR.
- ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL POWER SHALL BE INSTALLED WITH DISCONNECT SWITCHES AT EACH PIECE OF EQUIPMENT. COORDINATE SWITCH TYPE (FUSED OR NON-FUSED) WITH EQUIPMENT CHARACTERISTICS, MANUFACTURER'S RECOMMENDATIONS AND THE ELECTRICAL DRAWINGS.
- ALL REQUIRED CONTROL WIRING (INCLUDING POWER WIRING REQUIRED FOR CONTROL PANELS, DEVICES, ETC.) NOT SHOWN ON THE ELECTRICAL DRAWINGS SHALL BE INCLUDED AS PART OF THE MECHANICAL WORK. WIRING IN HVAC PLENUM SPACES SHALL BE INSTALLED ACCORDING TO CODE REQUIREMENTS.
- UNLESS NOTED OTHERWISE, TRANSFORMERS, CONTROLS AND CONTROL WIRING REQUIRED FOR ALL MECHANICAL SYSTEMS SHALL BE FURNISHED WITH THE EQUIPMENT IT SERVES AND INSTALLED BY THE MECHANICAL CONTRACTOR. MOTOR STARTERS FOR HVAC EQUIPMENT SHALL BE FURNISHED WITH THE MOTOR OR APPARATUS WHICH IT OPERATES. MOTOR STARTER INSTALLATION SHALL BE BY THE DIVISION 16 CONTRACTOR.

DUCT SMOKE DETECTORS:

- ALL FANS SUPPLYING MORE THAN 2000 CFM OF AIR TO ANY SPACE SHALL BE INSTALLED WITH A SMOKE DETECTOR IN THE RETURN DUCTWORK. DUCT SMOKE DETECTORS SHALL BE INSTALLED IN THE RETURN AIR PATH OF AIR DISTRIBUTION SYSTEMS UTILIZING A COMMON SUPPLY AND/OR RETURN AIR PLENUM WITH A COMBINED DESIGN CAPACITY GREATER THAN 2000 CFM.
- THE SMOKE DETECTOR SHALL BE WIRED TO STOP THE FAN UPON DETECTION OF SMOKE, AND SIGNAL THE BUILDING FIRE ALARM CONTROL PANEL. THE SMOKE DETECTOR SHALL BE FURNISHED BY THE ELECTRICAL CONTRACTOR, MOUNTED IN THE DUCT BY THE MECHANICAL CONTRACTOR, AND WIRED BY THE ELECTRICAL CONTRACTOR.

AIR DISTRIBUTION:

- SUPPLY, OA AND RETURN DUCTWORK SHALL BE CONSTRUCTED OF GALVANIZED SHEETMETAL AS RECOMMENDED IN SMACNA DUCT CONSTRUCTION STANDARDS, LATEST EDITION. ALL JOINTS AND SEAMS IN ALL SHEETMETAL DUCTWORK SHALL BE SEALED WITH DUCT SEALER.
- ALTERNATE DUCTWORK - 1" THICK FIBERGLASS DUCT BOARD (MINIMUM R-6 OR AS REQUIRED BY APPLICABLE ENERGY CODE), WITH GLASS FABRIC REINFORCED VAPOR BARRIER, JOHNS-MANVILLE TYPE 475 OR EQUAL. FIBERGLASS DUCTWORK AND TAPING SYSTEM SHALL BE U.L.-181 LISTED AND SHALL BEAR THE U.L. LABEL. ALL FIBERGLASS DUCTWORK AND ACCESSORIES SHALL BE FABRICATED BY A MANUFACTURER'S AUTHORIZED FABRICATOR, SHALL BE INSTALLED WITH THE FABRICATOR'S SUPERVISION AND ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. FIBERGLASS DUCTWORK SHALL NOT BE USED OUTDOORS.
- EXHAUST DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED TO SMACNA STANDARDS AND SHALL NOT BE INSULATED UNLESS NOTED OTHERWISE.
- ALL DUCTWORK SHALL BE SUPPORTED BY THE BUILDING STRUCTURE AND SHALL NOT REST ON CEILING TILES OR CEILING STRUCTURE. DUCT SUPPORTS AND ATTACHMENT TO STRUCTURE SHALL BE PER SMACNA STANDARDS.
- FLEXIBLE DUCTWORK SHALL BE THERMAFLEX M-KE (U.L. 181 LISTED, CLASS 1 FLEXIBLE AIR DUCT) OR EQUAL. PROVIDE THERMAFLEX M-KE R-8 (R-VALUE - 8.0 MINIMUM OR AS REQUIRED BY LOCAL ENERGY CODE) IN ATTICS AND OTHER UNCONDITIONED SPACES. AIR CONNECTORS ARE NOT ACCEPTABLE. FLEX DUCT DIAMETER SHALL MATCH DEVICE NECK DIAMETER. FLEXIBLE DUCTWORK SHALL BE INSTALLED AS STRAIGHT AS POSSIBLE AND SHALL BE ROUTED AND SUPPORTED WITHOUT FORMING CRUMPS OR OTHER AIR FLOW RESTRICTIONS. PROVIDE SQUARE TO ROUND ADAPTERS OR BOOTS TO CONNECT TO AIR DEVICE NECK WHEN REQUIRED.
- ROUND AND FLEXIBLE SUPPLY AIR DUCTWORK SHALL BE CONNECTED TO MAIN DUCTS WITH A TAB TYPE FITTING. THE DAMPER SHALL BE LOCATED AS SPECIFIED ON THE EQUIPMENT SCHEDULE.
- TAPE, BED AND SEAL AIR TIGHT ALL PENETRATIONS FROM RETURN AIR PLENUMS TO NON RETURN AIR PLENUMS THAT ARE REQUIRED DUE TO DUCTWORK, PIPING OR OTHER ITEMS.
- DUCTWORK DIMENSIONS SHOWN ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.
- EXTERNAL STATIC PRESSURE (ESP) DOES NOT INCLUDE COIL, CASING OR FILTER PRESSURE DROP.
- INSTALL FIRE DAMPERS IN ALL RATED WALLS, FLOOR AND CEILING PENETRATIONS. FIRE DAMPERS SHALL BE THE DYNAMIC TYPE WITH BLADES OUT OF THE AIRSTREAM WHERE POSSIBLE. REFER TO THE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF RATED ASSEMBLIES. PROVIDE ACCESS DOORS IN DUCTWORK AT EACH FIRE DAMPER LOCATION. INSTALL SMOKE DAMPERS IN ALL DUCT PENETRATIONS THROUGH SMOKE RATED WALLS, WHERE DUCTS PENETRATE WALLS THAT CARRY BOTH FIRE AND SMOKE RATINGS, THE DAMPERS INSTALLED SHALL BE COMBINATION FIRE AND SMOKE DAMPERS. ALL DAMPERS SHALL BE U.L. 555 AND/OR 555S LABELED.

- LOCATIONS OF GRILLES, REGISTERS, & DIFFUSERS SHOWN ON THE DRAWINGS ARE APPROXIMATE. COORDINATE EXACT LOCATIONS WITH LIGHTS, CEILING GRID, ETC. AND ARCHITECTURAL REFLECTED CEILING PLAN.

INSULATION:

1. DUCT INSULATION:

- DUCT WRAP SHALL BE UL LISTED FIBERGLASS BLANKET INSULATION WITH FOIL VAPOR BARRIER. PUNCTURES AND TEARS IN THE FOIL JACKET SHALL BE PATCHED WITH FOIL TAPE TO MAINTAIN THE INTEGRITY OF THE VAPOR BARRIER. INSULATE SHEET METAL DUCTWORK IN THE THICKNESSES AND DENSITIES AS LISTED BELOW:
 - SHEET METAL SUPPLY DUCTWORK IN NON-AIR CONDITIONED AREAS: 2" THICK, 1-1/2 LB/FT3 DENSITY.
 - SHEET METAL SUPPLY DUCTWORK IN AIR CONDITIONED AREAS: 2" THICK, 3/4 LB/FT3 DENSITY.
 - OUTSIDE AIR DUCTWORK: 2" THICK, 1-1/2 LB/FT3 DENSITY.
 - RETURN DUCTWORK IN NON-AIR CONDITIONED AREAS: 2" THICK, 1-1/2 LB/FT3 DENSITY.
 - ALL SUPPLY AND RETURN DUCTWORK WITHIN AN OPEN ATTIC SPACE: 2" THICK, 1-1/2 LB/FT3 DENSITY (MIN R-8).
 - ELEVATOR RELIEF DUCTWORK SHALL BE WRAPPED USING A U.L. LISTED AND APPROVED FIRE WRAP OR ENCLOSED IN AN APPROVED ASSEMBLY. FIRE WRAP ASSEMBLY SHALL PROVIDE THE SAME RATING AS THE ELEVATOR HOISTWAY ASSEMBLY RATING.
- DUCT LINER: LINE ALL SHEETMETAL DUCTWORK A MINIMUM OF 10'-0" (OR AS INDICATED) DOWNSTREAM OF ROOFTOP UNITS. DUCT LINER SHALL BE 1" THICK, 3 LB/FT3 DENSITY (MINIMUM R VALUE = 4.0 OR AS REQUIRED BY APPLICABLE ENERGY CODE); CERTAINTED TOUGHGUARD 2" OR EQUAL BY KNAUF OR JOHNS-MANVILLE. THE LEADING EDGE OF THE DUCT LINER SHALL HAVE A SHEETMETAL NOSING.

3. PIPE INSULATION:

- REFRIGERANT SUCTION PIPING SHALL BE INSULATED WITH 1-1/2" THICK FLEXIBLE ELASTOMERIC TUBING INSULATION, AP ARMAFLEX PIPE INSULATION MANUFACTURED BY ARMAFLEX OR EQUAL. INSULATION SHALL BE SLID OVER PIPING FROM ONE END BEFORE PIPE ENDS ARE JOINED AND SHALL NOT BE SLIT OR CUT. ALL JOINTS AND SEAMS SHALL BE SEALED WEATHER-TIGHT. FINISH COAT FOR FLEXIBLE ELASTOMERIC INSULATION INSTALLED OUTDOORS SHALL BE WATER-BASED LATEX ENAMEL DESIGNED FOR USE OVER ALL FORMS OF FLEXIBLE ELASTOMERIC INSULATION. FINISH COAT SHALL PROVIDE A PROTECTIVE FINISH SUITABLE TO BOTH INDOOR AND OUTDOOR APPLICATIONS, FORMULATED FOR COLD WEATHER FLEXIBILITY TO RESIST CRACKING AND WEATHER-RESISTANT TO ULTRAVIOLET (UV) AND OZONE. COATING SHALL BE ARMAFLEX WB FINISH OR EQUIVALENT.

PIPING:

- REFRIGERANT PIPING SHALL BE TYPE L OR REFRIGERATION SERVICE COPPER TUBING WITH BRAZED JOINTS.
- CONDENSATE FROM ALL AIR CONDITIONING EQUIPMENT SHALL BE TRAPPED AND ROUTED TO THE NEAREST FLOOR DRAIN OR TO EXTERIOR DRY WELLS. CONDENSATE PIPING SHALL BE SCHEDULE 40 PVC (EXCEPT INSULATED COPPER IN HVAC PLENUMS). CONDENSATE SHALL BE PUMPED AS REQUIRED.

DWELLING UNITS:

- DRYER FLEXIBLE DUCTWORK SHALL BE CONNECTED TO A MANUFACTURED DRYER WALL BOX (BY IN-O-VATE OR EQUAL). THE FLEXIBLE DUCTWORK SHALL CONNECT THE LAUNDRY DRYER TO THE BOX CONNECTION USING A C-CLAMP AND BE INSTALLED AS SHOWN ON PLANS. THE DRYER CONNECTION IN THE DWELLING UNIT SHALL BE BASED ON LAUNDRY DRYER TYPE AND COORDINATED IN THE FIELD.
- DRYER VENT DUCTWORK SHALL BE 4 OR 5-INCH ROUND AND BE 26 GAUGE GALVANIZED STEEL INSTALLED WITH LONGITUDINAL SEAMS FACING UP. ROUTE DRYER VENT TO THE EXTERIOR WALL CAP AS DIRECT AS POSSIBLE. DO NOT SECURE DUCTWORK WITH SHEET METAL SCREWS.
- TOILET AND LAUNDRY EXHAUST DUCTWORK SHALL BE FURNISHED WITH A BUILT-IN BACK-DRAFT DAMPER. TOILET EXHAUST SHALL INCLUDE INSECT SCREEN.
- DWELLING UNIT KITCHEN RANGE HOODS SHALL BE VENTLESS, RECIRCULATING TYPE AND BE PROVIDED BY OTHERS.
- NATURAL VENTILATION PROVIDED VIA OPERABLE WINDOWS.

COMMON AREA SPLIT SYSTEM DX WITH ELEC. HEAT

TAG	INDOOR MODEL No. (AH)	OUTDOOR MODEL No. (CU)	NOM. TONS	MBH TOT. COOL	MBH SENS. COOL	TOTAL CFM	ESP IN. W.G.	FAN HP	HEATING KW (OUTPUT)	O/A CFM	ACCESSORIES
AH/CU-1	ARUF3642	GSX13042	3.5	37.7	28.5	1380	0.40"	1/3	15.0	250	1,2,3,4,5,6,7,8,9,10,11
AH/CU-2	ARUF4860	GSX13060	5.0	55.0	41.0	1805	0.50"	3/4	20.0	300	1,2,3,4,5,6,7,8,9,10,11
AH/CU-3	ARUF1824	GSZ13024	2.0	23.1	19.2	750	0.40"	1/3	10.0	140	1,2,3,4,5,6,7,8,9,10,11
AH/CU-4	ARUF4860	GSX13060	5.0	55.0	41.0	1805	0.50"	3/4	20.0	300	1,2,3,4,5,6,7,8,9,10,11
AH/CU-5	ARUF3030	GSX13030	2.5	27.3	21.8	1050	0.50"	1/3	10.0	100	1,2,3,4,5,6,7,8,9,10,11

NOTES:

- COOLING CAPACITIES ARE BASED ON 105°F AMBIENT, 80°F DB/67°F WB ENTERING AIR TEMPERATURE.
- COMPRESSOR MANUFACTURER SHALL PROVIDE A REFRIGERANT PIPING DIAGRAM APPROVED BY FACTORY FOR TYPICAL SYSTEMS SHOWING COMPONENTS SUCH AS SUCTION LINE ACCUMULATOR AND RECOMMENDED PIPE SIZES FOR PROPER OPERATION.
- 13 SEER MINIMUM UNITS.

ACCESSORIES:

- 7-DAY PROGRAMMABLE T-STAT PER 2009 IECC.
- REMOVABLE/THROWAWAY FILTER IN FILTER RACK.
- INDOOR UNIT TO HAVE FACTORY MOUNTED THERMAL EXPANSION VALVE IF REQUIRED FOR 13.0 SEER RATING.
- EXTERNAL REFRIGERANT FILTER DRYER AT OUTDOOR CONDENSER UNIT IF REQUIRED BY MANUFACTURER.
- ROOF MOUNTED OUTDOOR UNITS SHALL BE INSTALLED PER PLANS.
- DISCONNECT FOR INDOOR UNITS BY DIVISION 15.
- DISCONNECT FOR OUTDOOR UNITS BY DIVISION 16.
- PRIMARY CONDENSATE SHALL BE TRAPPED AND ROUTED AS SHOWN ON PLUMBING PLANS. REFER TO UNIT PLANS AND PLUMBING PLANS.
- PROVIDE FLOAT SAFE-T-SWITCH IN DRAIN PAN FOR SECONDARY CONDENSATE.
- FIELD INSTALLED ELECTRICAL HEAT FOR UNIT OUTPUT SPECIFIED ON SCHEDULE.
- PROVIDE SMOKE DETECTOR IN RETURN AIR PATH.

SELECTIONS ARE BASED ON PRODUCTS BY: GOODMAN.

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FANS

TAG	MODEL	DUTY	CFM	E.S.P.	SONES	MOTOR SIZE	RPM	DRIVE	WEIGHT (LBS)	ACCESSORIES
EF-1(TYP.)	(B)670	TOILET EXHAUST	50	0.25"	3.5	FRACTIONAL	1050	DIRECT	15	1,2,3
EF-2	SP-B200	TOILET EXHAUST	150	0.375"	3.7	FRACTIONAL	902	DIRECT	25	1,2,3,4
EF-3	SP-B200	TOILET EXHAUST	150	0.375"	3.7	FRACTIONAL	902	DIRECT	25	1,2,3,4
EF-A(TYP.)	SBE-3L48	GARAGE VENTILATION	38,200	0.25"	36	7.5	642	BELT	450	6,7,8,9,10,11,12
EF-B(TYP.)	SE2-16-435-B	GARAGE VENTILATION	1,400	0.25"	17.5	1/6	1160	DIRECT	40	3,5,8,9,11
EF-C(TYP.)	KRU 12-4	ROOF VENTILATION	50	0.03"	3.0	FRACTIONAL	FRAC	DIRECT	60	1,3,4,13,14,15
EF-D(TYP.)	KRU 12-4	ROOF VENTILATION	75	0.03"	3.0	FRACTIONAL	FRAC	DIRECT	60	1,3,4,13,14,15
EF-E(TYP.)	KRU 12-4	ROOF VENTILATION	100	0.03"	3.0	FRACTIONAL	FRAC	DIRECT	60	1,3,4,13,14,15
EF-F(TYP.)	KRU 12-4	ROOF VENTILATION	120	0.03"	3.0	FRACTIONAL	FRAC	DIRECT	60	1,3,4,13,14,15
EF-G(TYP.)	KRU 12-4	ROOF VENTILATION	140	0.03"	3.0	FRACTIONAL	FRAC	DIRECT	60	1,3,4,13,14,15
EF-H(TYP.)	SP-BT50	TRASH EXHAUST	75	0.375"	1.9	FRACTIONAL	676	DIRECT	15	1,3,7,16
SF-1	TD-100	SUPPLY FAN, MAINT.	30	0.125	2.0	FRACTIONAL	FRAC	DIRECT	2	1,3,5,9

ACCESSORIES:

- GRAVITY BACKDRIFT DAMPER.
- WIRE INTO DEDICATED WALL SWITCH (COORDINATE WITH ELECTRICAL).
- DISCONNECT BY DIV. 15.
- UNIT MOUNTED SPEED CONTROL SWITCH.
- CONTINUOUS DUTY.
- INTERLOCK TO CO2 CONTROLLER.
- MOTORIZED DAMPER, INTERLOCKED TO FAN.
- FLUSH EXTERIOR WALL HOUSING.
- 1 1/4" INSECT SCREEN.
- TRASH EXHAUST WITH SMOKE DETECTOR, HUMIDITY SENSOR, RET. VALVE AND 402R/H (ADJ.).
- 14" ROOF CURB.
- WIRE INTO DEDICATED WALL SWITCH WITH INDICATOR LIGHT. MOUNT PLAQUE ABOVE SWITCH "TRASH EXHAUST"
- 1" FAN GUARD.
- 1" FAN GUARD.
12. BEARINGS WITH GREASE FITTINGS, ADJUSTABLE BELT DRIVE AND PULLEYS.

SELECTIONS ARE BASED ON PRODUCTS BY: BROAN (EF-1), KANALFLAKT (EF-C,D,E,F,G), S&P (SF-1) AND GREENHECK (ALL REMAINING FANS).

LEGEND

SYMBOL	DESCRIPTION	ABBREVIATIONS	SYMBOL	DESCRIPTION	ABBREVIATIONS
	CEILING DIFFUSER W/FLEX DUCT	CD		AIR DISTRIBUTION DEVICE TAG, BALANCE TO 205 CFM	---
	CEILING RETURN GRILLE W/FLEX DUCT	RAG		SMOKE DETECTOR	SD
	SIDEWALL SUPPLY AIR GRILLE	S. REG		RETURN AIR	RA
	SIDEWALL RETURN AIR GRILLE	RAG		SUPPLY AIR	S.A.
	FIRE DAMPER / CEILING RADIATION DAMPER	FD / CRD		ABOVE FINISHED FLOOR	AFF
	MANUAL VOLUME DAMPER	MVD		EXTERNAL STATIC PRESSURE (IN W.C.)	ESP
	EXHAUST FAN	EF---		DRY BULB	DB
	RISE	R		WET BULB	WB
	DROP	D		ENTERING AIR TEMPERATURE	EAT
	THERMOSTAT	T-STAT		LEAVING AIR TEMPERATURE	LAT
	EQUIPMENT DESIGNATION			OUTSIDE AIR	OA
	TRANSFER GRILLE	TXR		RETURN AIR GRILLE	RAG
	OPPOSED BLADE DAMPER	OBD		COMBINATION SMOKE/FIRE DAMPER	SFD
	SEALED RA PLENUM FURDOWN			ARCHITECTURAL FURDOWN	

APARTMENT SPLIT SYSTEM DX WITH ELEC. HEAT

TAG	INDOOR AH MODEL NO. (GOODMAN)	OUTDOOR CU MODEL NO. (GOODMAN)	NOM. TONS	MBH TOT. COOL	MBH SENS. COOL	TOTAL CFM	ESP	MAX. FAN HP	AUXILIARY HEATING KW (MIN. OUTPUT)	ACCESSORIES
AH/CU-A1	ACNF2406	GSX13018	1.5	15.2	12.0	565	0.4"	1/4	6.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-A1R	ACNF2408	GSX13024	2.0	19.1	15.0	735	0.4"	1/4	8.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-A2	ACNF2406	GSX13018	1.5	15.2	12.0	565	0.4"	1/4	6.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-A2SP	ACNF2408	GSX13024	2.0	19.1	15.0	735	0.4"	1/4	8.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-A3	ACNF2408	GSX13024	2.0	19.1	15.0	735	0.4"	1/4	8.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-A4	ACNF2408	GSX13024	2.0	19.1	15.0	735	0.4"	1/4	8.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-B1A	ACNF2406	GSX13018	1.5	15.2	12.0	565	0.4"	1/4	6.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-B1B	ACNF2406	GSX13018	1.5	15.2	12.0	565	0.4"	1/4	6.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-B2A	ACNF2406	GSX13018	1.5	15.2	12.0	565	0.4"	1/4	6.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-B2B	ACNF2406	GSX13018	1.5	15.2	12.0	565	0.4"	1/4	6.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-B3A	ACNF2408	GSX13024	2.0	19.1	15.0	735	0.4"	1/4	8.0	1,2,3,4,5,6,7,8,9,10,11
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AH/CU-E1	ACNF2406	GSX13018	1.5	15.2	12.0	565	0.4"	1/4	6.0	1,2,3,4,5,6,7,8,9,10,11
AH/CU-E1R	ACNF2408	GSX13024	2.0	19.1	15.0	735	0.4"	1/4	8.0	1,2,3,4,5,6,7,8,9,10,11

NOTES:

- COOLING CAPACITIES ARE BASED ON 105°F AMBIENT, 75°F DB/63°F WB ENTERING AIR TEMPERATURE.
- COMPRESSOR MANUFACTURER SHALL PROVIDE A REFRIGERANT PIPING DIAGRAM APPROVED BY FACTORY FOR TYPICAL SYSTEMS SHOWING COMPONENTS SUCH AS SUCTION LINE ACCUMULATOR AND RECOMMENDED PIPE SIZES FOR PROPER OPERATION.
- 13 SEER MINIMUM UNITS.

ACCESSORIES:

- FACTORY-INSTALLED ELECTRIC HEAT WITH THERMAL OVERLOADS.
- 7-DAY PROGRAMMABLE T-STAT.
- REMOVABLE/THROWAWAY FILTER IN RETURN GRILLE.
- INDOOR UNIT TO HAVE FACTORY MOUNTED THERMAL EXPANSION VALVE IF REQUIRED FOR 13.0 SEER RATING.
- EXTERNAL REFRIGERANT FILTER DRYER AT OUTDOOR CONDENSER UNIT IF REQUIRED BY MANUFACTURER.
- ROOF MOUNTED OUTDOOR UNITS SHALL BE INSTALLED PER PLANS.
- DISCONNECT FOR INDOOR UNITS BY DIVISION 16.
- DISCONNECT FOR OUTDOOR UNITS BY DIVISION 16.
- PRIMARY CONDENSATE SHALL BE TRAPPED AND ROUTED TO LAVATORY TAILPIECE.
- SECONDARY CONDENSATE ROUTED ABOVE THE UNIT TO EXTERIOR WALL.
- PROVIDE CEILING ACCESS PANEL FOR UNIT MAINTENANCE AND REMOVAL.

SELECTIONS ARE BASED ON PRODUCTS BY: