AAON®

RF Series

40 to 130 tons
Packaged Rooftop Conditioners & Air Handlers

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AAON, Inc.
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EQUIPMENT DESCRIPTION

UNIT SELECTION EXAMPLE: MODEL AND FEATURE NUMBER STRUCTURE

BASE MODEL No.		(14) FEATURE OPTIONS
RF - 040 - 3 - EØ	231	: C / Ø / Ø / A / R / A / D / D / H / Ø / Ø / J / Ø / B
BASE UNIT No.		ALL FEATURE NUMBERS MUST BE COMPLETED TO PROPERLY IDENTIFY THE UNIT & TO INSURE PROMPT ORDER PROCESSING.
TOTAL UNIT IDENTIFICATION NUMBER		

STANDARD FEATURES INCLUDE

- CONTROLS & COMPRESSORS ARE LOCATED IN A SINGLE, WALK-IN COMPARTMENT
- HERMETICALLY SEALED SCROLL COMPRESSORS
- COMPRESSORS ARE ELEVATED & ISOLATED FOR ACOUSTICAL PURPOSES
- SINGLE POINT POWER CONNECTION
- 115v CONTROL CIRCUIT w/ TERMINAL BLOCK
- LOW AMBIENT CONTROL TO 35 DEGREES
- THERMOSTATIC EXPANSION VALVES
- LIQUID LINE FILTER DRIERS
- MANUAL RESET HIGH PRESSURE SWITCHES
- AUTO RESET LOW PRESSURE SWITCHES
- GRIP NOTCH BLOWER DRIVE BELTS
- DIRECT DRIVE 3 PHASE 1140 RPM TOTALLY ENCLOSED CONDENSER FAN MOTORS

- STAINLESS STEEL PIANO HINGE ON ACCESS DOORS w/ TOOLESS ACCESS LATCHES
- TOP IS SLOPED FOR DRAINAGE
- DOUBLE WALL CONSTRUCTION ON THE AIR SIDE
- BOTTOM SUPPLY AIR & RETURN AIR
- MANUALLY ADJUSTED OUTSIDE AIR HOOD (0-25%)
- P-TRAP CONDENSATE DRAIN (field installed)

- RUN TEST REPORT, INSTALLATION MANUAL, WIRING DIAGRAM & START-UP FORM ARE LOCATED IN THE CONTROL ACCESS COMPARTMENT.

RF SERIES MODEL MASTER

MODEL NUMBER

TYPE	GEN.		UNIT SIZE		VOLTAGE		COOLING		HEATING
R	F	-		-		-		-	

TYPE
R = ROOFTOP

GENERATION
F = SIXTH

UNIT SIZE
NOMINAL

	TONS / CFM
040 =	40 / 16,000
050 =	50 / 20,000
060 =	60 / 24,000
070 =	70 / 28,000
080 =	80 / 32,000
090 =	90 / 36,000
110 =	110 / 44,000
120 =	120 / 48,000
130 =	130 / 50,000

VOLTAGE
2 = 208-230v / 3ø / 60Hz
3 = 460v / 3ø / 60Hz

COOLING

COMPRESSORIZED w/ COIL	= E
COMPRESSORIZED • 6 ROW COIL	= F

NO CONDENSING SECTION

NO COOLING (no cond. section)	= Ø
CHILLED WATER • 4 ROW COIL	= 3
CHILLED WATER • 6 ROW COIL	= 4
NON-COMPRESSORIZED w/ DX COIL	= 5
NON-COMPRESSORIZED • 6 ROW DX COIL	= 6

Ø = STANDARD
1 = Phenolic Coated Coils (Specified Corrosion Protection)
2 = Pre-Coated Fin Stock with Corrosion Protected Coil Casing

HEATING

TYPE
Ø = N/A *(No Heating)*
1 = Electric Heating
3 = Nat.Gas•Stainless Stl
6 = Steam
7 = Hot Water

STAGE
Ø = Cooling Only; Stm or HW
1 = 1 Stage Electric Heat
2 = 2 Stage Electric Heat
4 = 4 Stage Electric Heat
3 = Standard Gas Staging
6 = Standard Staging • Hi Altitude Gas Heating Only
X = Special Staging

DESIGNATION

ELECTRIC HEAT (240v • 480v) OR **GAS ; STEAM ; or HOT WATER HEATING**

D =	40.0
F =	80.0
H =	120.0
J =	160.0
K =	200.0

Electric Heat Strips Are At 40kw Increments

Ø = N/A *(No Heating)*

NATURAL GAS HEATING
1 = Low Heat
2 = Medium Heat
3 = High Heat

STEAM HEATING COILS
4 = 2 Row Steam • Coil A (12,000 - 28,000 CFM)
6 = 2 Row Steam • Coil B (28,000 - 50,000 CFM)

HOT WATER HEATING COILS
5 = 2 Row Hot Water • Coil A (12,000 - 28,000 CFM)
7 = 2 Row Hot Water • Coil B (28,000 - 50,000 CFM)

RF • OPTIONAL FEATURES

FEATURE NUMBER

O.S.A	BLWR. MTR.	FILTERS	REFRIG. ELECT.	REFRIG.	POWER	SAFETY
1	2	3	4	5	6	7

NOTE: SOME OPTIONS DO NOT APPLY TO ALL ROOFTOP UNITS.

OUTSIDE AIR OPTIONS (1)

Ø = **STANDARD** - Manual Outside Air **(0 - 25% Adjustable)**
L = 100% O.S.A HOOD **(Non-Motorized - NO RETURN AIR)**
A = 3 POSITION ECONOMIZER **w/ Sensible Limit Control**
B = 3 POSITION ECON. **w/ Enthalpy Limit Control**
C = FULL MODULATING ECON. CONTROL, **Mixed Air,w/ Enthalpy Limit**
K = FULL MODULATING ECON., **DDC Signal (by others)**
T = FULL MODULATING ECON. CONTROL, **Mixed Air,w/ Sensible Limit**
D = 2 POSITION MOTORIZED O.S.A Damper-(0 - 50%)
E = 2 POSITION MOTORIZED O.S.A Damper-(0 -100% **-NO RETURN AIR)**
S = PLENUM FAN EXHAUST (2) FANS **w/ "C" Econ.**
M = PROPELLER EXH. (1) Fan **w/ "C" Econ.**
N = PROPELLER EXH. (2) Fans **w/ "C" Econ.**
U = HEAT RECOVERY UNIT w/ 3 POSITION ECON. - (12,000 CFM)
V = HEAT RECOVERY UNIT w/ FULL MOD. ECON. - (12,000 CFM)
W= HEAT RECOVERY UNIT w/ 3 POSITION ECON. - (24,000 CFM)
Y = HEAT RECOVERY UNIT w/ FULL MOD. ECON. - (24,000 CFM)
F = POWER RETURN **w/ "C" Econ., Standard Motor**
G = POWER RETURN **w/ "C" Econ., Oversize Motor**
H = POWER RETURN **w/ "C" Econ., Double Oversize Motor**
P = POWER RETURN **w/ "C" Econ., Standard Mtr. w/ Inlet Vane**
Q = POWER RETURN **w/ "C" Econ., Oversize Mtr. w/ Inlet Vane**
R = POWER RETURN **w/ "C" Econ., Double Oversize Mtr. w/ Inlet Vane**
1 = POWER RETURN **w/ "C" Econ., Std. Hi-EFFICIENT Mtr.**
2 = POWER RETURN **w/ "C" Econ., Oversize HI-EFFICIENT Mtr.**
3 = POWER RETURN **w/ "C" Econ., Double Oversize HI-EFFICIENT Mtr.**
4 = POWER RETURN **w/ "C" Econ., Std. HI-EFF. Mtr. w/ Inlet Vane**
5 = POWER RETURN **w/ "C" Econ., Oversize HI-EFF. Mtr. w/ Inlet Vane**
6 = POWER RETURN **w/ "C" Econ., Dble OS HI-EFF. Mtr. w/ Inlet Vane**
7 = POWER RETURN **w/ "C" Econ., Std. HI-EFF. Mtr. w/ Inverter**
8 = POWER RETURN **w/ "C" Econ., Oversize HI-EFF. Mtr. w/ Inverter**
9 = POWER RETURN **w/ "C" Econ., Dble OS HI-EFF. Mtr. w/ Inverter**

EVAP. BLOWER MOTOR OPTIONS (2)

Ø = **STANDARD**
A = OVERSIZE MOTOR
B = DOUBLE OVERSIZE MOTOR
F = STANDARD HIGH EFFICIENCY MOTOR
G = OVERSIZED HIGH EFFICIENCY MOTOR
H = DBLE. OVERSIZED HIGH EFFICIENCY MOTOR
J = STANDARD HIGH EFFICIENCY MOTOR w/ INVERTER CONTROLLER
K = OVERSIZED HIGH EFFICIENCY MOTOR w/ INVERTER CONTROLLER
L = DBLE.OVERSIZED HIGH EFFICIENCY MOTOR w/ INVERTER CONTROLLER
M = STANDARD MOTOR w/ INLET VANE
N = OVERSIZED MOTOR w/ INLET VANE
P = DBLE. OVERSIZED MOTOR w/ INLET VANE
Q = STANDARD HIGH EFFICIENCY MTR. w/ INLET VANE
R = OVERSIZED HIGH EFFICIENCY MTR. w/ INLET VANE
S = DBLE. OVERSIZED HIGH EFFICIENCY MTR. w/ INLET VANE

FILTER OPTIONS (3)

Ø = 2" PLEATED - Straight Bank (Intregal Return 28,000 CFM Max)
A = 4" PLEATED - Straight Bank (Intregal Return 28,000 CFM Max)
B = 2" PLEATED - Angle Bank w/ 6' Return (also 10' Pwr.Rtn / Exh)
C = 4" PLEATED - Angle Bank w/ 6' Return (also 10' Pwr.Rtn / Exh)
D = Option Ø + Clogged Filter Switch (2")
E = Option B + Clogged Filter Switch (2")
F = Option Ø + Magnahelic Gauge
G = Option A + Magnahelic Gauge
H = Option B + Magnahelic Gauge
J = Option C + Magnahelic Gauge
K = Option Ø + Clogged Filter Switch + Magnahelic Gauge
L = Option B + Clogged Filter Switch + Magnahelic Gauge
M = 2" Permanent Frame-Straight Bank (Intregal Rtn 28,000 CFM Max)
N = 2" Permanent Frame-Angle Bank 6' Return (also 10' Pwr.Rtn / Exh)
P = Option M + Clogged Filter Switch (2")
Q = Option N + Clogged Filter Switch (2")
R = Option M + Magnahelic Gauge
S = Option N + Magnahelic Gauge
T = Option M + Clogged Filter Switch + Magnahelic Gauge
U = Option N + Clogged Filter Switch + Magnahelic Gauge
V = 12" Cartridge w/ 4" Pre-Filters; Incldes CFSw & Mag.Ga.(32,000 CFM)
W= 12" Cart. w/ 4" Pre-Filters; Incldes CFSw & Mag.Ga.(40,000 CFM)
(Includes opt. 8ft. access. box)

REFRIGERATION CONTROL (ELECTRICAL) (4)

Ø = **STANDARD**
A = 5 MIN. TIME DELAY RELAY - **1 per Comp. (5 MTDR)**
B = 20 SECOND TIME DELAY RELAY **(20 STDR)**
C = 115v GFI Outlet **(Field Wired) 20 Amps Max.**
D = 115v GFI Outlet **(Factory Wired @ 13 Amps)**
E = **(A + B) 5** MTDR + **20** STDR
F = **(A + C) 5** MTDR + 115v Outlet **(Field Wired)**
G = **(A + D) 5** MTDR + 115v Outlet **(Factory Wired)**
H = **(A+B+C) 5** MTDR + 20 STDR + 115v Outlet **(Field Wired)**
J = **(A+B+D) 5** MTDR + 20 STDR + 115v Outlet **(Factory Wirec**
K = **(B + C)** 20 STDR + 115v Outlet **(Field Wired)**
L = **(B + D)** 20 STDR + 115v Outlet **(Factory Wired)**

CTRLS / SPCL CTRLS / BELT GUARDS / CODE / CABNT / EXH. MOTOR / TYPE

8 9 10 11 12 13 14

NOTE: SOME OPTIONS DO NOT APPLY TO ALL ROOFTOP UNITS.

TYPE (14)

B = **STANDARD** (Includes 'GRAY PAINT')

U = **Special price auth. & special color** exterior paint

X = **SPECIAL PRICE AUTHORIZATION** (Includes 'B' above)

(OPTIONS 'U' or 'X') CONSULT FACTORY FOR AUTHORIZATION

BELT GUARDS (10)

Ø = **STANDARD**
P = OSHA Approved Belt Guard • S/A
Q = OSHA Belt Guard • S/A & PR/A

EXHAUST MOTOR (13)

Ø = **STANDARD** w/o Heatwheel or Plenum Exh.
C' -'F' use w/ Heatwheel Features 1-U,V,W or Y
C = Standard Motor (5HP)
D = Oversize Motor (10 HP)
E = Standard Hi-Efficiency Mtr w/Inverter (5 HP)
F = Oversize Hi-Efficiency Mtr w/Inverter (10 HP)
G' -'M' use w/ Plenum Exh. Feature 1-'S'
G = Standard Motor (5HP)
H = Oversize Motor (10 HP)
J = Standard Mtr w/Inlet Vane (5 HP)
K = Oversize Mtr w/Inlet Vane (10 HP)
L = Standard Hi-Efficiency Mtr w/Inverter (5 HP)
M = Oversize Hi-Efficiency Mtr w/Inverter (10 HP)

CONTROLS (8)

Ø = **STANDARD CONTROLS**
B = LOW LIMIT CONTROL **(LLC)**
D = PHASE & BROWN OUT PROTECTION **(Ph / BOP)**
K = LowLimit Ctl + Phase & BrnOut Pro.

SAFETY OPTIONS (7)

Ø = **STANDARD**
B = R/A & S/A FIRESTAT **(R/A & S/A FS)**
D = R/A SMOKE DETECTOR **(R/A S.D)**
E = S/A SMOKE DETECTOR **(S/A S.D)**
G = R/A & S/A **SMOKE DETECTOR**
H = R/A & S/A **FIRESTAT & R/A SMOKE DETECTOR**
J = R/A & S/A **FIRESTAT & S/A SMOKE DETECTOR**
L = R/A & S/A **FS + S/A & R/A SMOKE DETECTOR**

CABINET OPTIONS (12)

Ø = **STANDARD**
C = S/A & R/A BURG. BARS (S/A & R/A BB)
H = STAINLESS STEEL CONDENSATE DRAIN PAN
J = S/A & R/A BB + Stainless Steel Drain Pan
K = MARINE SERVICE LIGHTS
L = S/A & R/A BB + Marine Service Lights
M = Stainless Steel Drain Pan + Marine Service Lights
N = S/A & R/A BB + S.S. Drain Pan + Marine Service Lights

POWER OPTIONS (6)

Ø = **STANDARD - POWER BLOCK**
A = POWER SWITCH - Cooling & Gas Units **(FULL CABINET)**
B = POWER SWITCH - All But Elect Heat **(No Cond. Section)**
D = POWER SWITCH - Elect Heat Units **(40 kw)**
E = POWER SWITCH - Elect Heat Units **(80 kw)**
F = POWER SWITCH - Elect Heat Units **(120 kw)**
G = POWER SWITCH - Elect Heat Units **(160 kw)**
H = POWER SWITCH - Elect Heat Units **(200 kw)**

CODE OPTIONS (11)

Ø = **STANDARD**
A = M.E.A (NEW YORK)
B = CHICAGO (CITY) ~ Gas w/ Full Cabinet
C = CHICAGO (CITY) ~ Elect. w/ Full Cabinet
D = CHICAGO (CITY) ~ Other w/ Full Cabinet
E = CHICAGO (CITY) ~ Gas w/ No Cond. Section
F = CHICAGO (CITY) ~ Elect. w/ No Cond. Section
G = CHICAGO (CITY) ~ Other w/ No Cond. Section

REFRIGERATION OPTIONS (5)

Ø = **STANDARD**
A = HOT GAS BYPASS ~ 1st STAGE **(HGB1)**
C = HOT GAS REHEAT COIL **(H.G.RHC)**
D = SIGHT GLASS **(SG)**
E = HotGasBypass1 + HotGasBypass2
F = HotGasBypass1 + HotGasBypass2 + SG
G = HotGasBypass1 + H.G. ReHeatCoil
H = HotGasBypass1 + SG
K = HotGasBypass1 + H.G. ReHeatCoil + SG
M = H.G.ReHeatCoil + SG
N = COMPRESSOR SERVICE ISOLATION VALVES
P = Comp. Isolation Valves + HotGasBypass1
Q = Comp. Isolation Valves + H.G.ReHeatCoil
R = Comp. Isolation Valves + SG
S = Comp. Isolation Valves + HGB1 + HGB2
T = Comp. Isolation Valves + HGB1 + HGB2 + SG
U = Comp. Isolation Valves + HGB1 + H.G.ReHeatCoil
V = Comp. Isolation Valves + HGB1 + SG
W = Comp. Isolation Valves + HGB1 + H.G.RHC + SG
Y = Comp. Isolation Valves + H.G.RHC + SG

SPECIAL CONTROLS (9)

Standard Mechanical Controls

Ø = **COOLING ONLY, STEAM or HOT WATER HEAT**
H = ALL GAS HEAT UNITS
J = ALL ELECTRIC HEAT UNITS
L = GAS HEAT UNITS w/ GAS PRESSURE REGULATORS

Micro Processor Related Controls

K = W973 HONEYWELL CONTROLLER
Q = W7100 HONEYWELL CONTROLLER
R = W7100 CONTROLLER + EXPANSION BOARD
D = VAV BLOWER CONTROL

CURB MODEL NUMBER

GEN.	CURB SIZE	CURB TYPE	STANDARD	HEIGHT	CURB I.D.
RF-		-KD-	ØØ	-	-

GENERATION

TYPE
KD = KNOCKDOWN (Field Assembled)

STD.
ØØ = STANDARD

HEIGHT
14 = 14" HIGH
24 = 24" HIGH
XX = SPECIAL HEIGHT

CURB I.D
Ø = STANDARD
X = SPECIAL INFO. REQ'D *(CONSULT FACTORY FOR AUTHORIZATION)*

CURB SIZE

		CURB WEIGHTS HEIGHT 14"	24"
	40 - 90 TON UNITS • UNDER 28,000 CFM		
A =	STANDARD CABINET / STANDARD RETURN AIR (R/A) SECTION w/ or w/o ECONOMIZER ..... (* Ref. Eng. Cat. Page A1, A2 For Unit Detail)	470	680
	• ALL AIRFLOWS		
B =	Optional Cab. w/ 6 Ft. R/A Section • Econ. OR Prop. Exh.(* Ref. Eng. Cat. Page A3, A4 For Unit Details).....	580	850
C =	Optional Cab. w/ 10 Ft. R/A Section • Pwr. Return OR Heat Recovery Wheel (* Ref. Eng. Cat. Page A5, A6).....	630	900
J =	Optional Cab. w/ 6 Ft. R/A Section OR Prop. Exh. + Opt. 8 Ft. Accessory Box (* Ref. Eng. Cat. Page A7, A8) ...	700	1040
K =	Optional Cab. w/ 10 Ft. R/A Section • Pwr. Return OR Heat Recovery Wheel + Opt. 8 Ft. Accessory Box..... (* Ref. Eng. Cat. Page A9, A10)	750	1100
	110 - 130 TON UNITS		
D =	STANDARD Cab. w/ 6 Ft. R/A Section • Econ. OR Prop. Exh. (* Ref. Eng. Cat. Page A11, A12).....	650	950
E =	Optional Cab. w/ 10 Ft. R/A Section • Pwr. Return OR Heat Recovery Wheel (* Ref. Eng. Cat. Page A13, A14)...	700	1030
L =	Optional Cab. w/ 6 Ft. R/A Section OR Prop. Exh. + Opt. 8 Ft. Accessory Box (* Ref. Eng. Cat. Page A15, A16).	800	1150
M =	Optional Cab. w/ 10 Ft. R/A Section • Pwr. Return OR Heat Recovery Wheel + Opt. 8 Ft. Accessory Box..... (* Ref. Eng. Cat. Page A17, A18)	850	1250
F =	STANDARD AIR HANDLER • 40 - 90 ONLY UNDER 28,000 CFM (* Ref. Eng. Cat. Pg A19, A20)	430	600
	40 - 130 TON AIR HANDLER • ALL AIR FLOWS		
G =	A/H Curb w/ 6 Ft. R/A Section • Econ. OR Prop. Exh. (* Ref. Eng. Cat. Page A21, A22)	530	770
H =	A/H Curb w/ 10 Ft. R/A Section • Pwr. Return OR Heat Recovery Wheel (* Ref. Eng. Cat. Page A23, A24)	580	840
N =	A/H Curb w/ 6 Ft. R/A Section OR Prop. Exh. + Opt. 8 Ft. Accessory Box (* Ref. Eng. Cat. Page A25, A26).....	670	960
P =	A/H Curb w/ 10 Ft. R/A Section • Pwr, Return OR Heat Recovery Wheel + Opt. 8 Ft. Accessory Box..... (* Ref. Eng. Cat. Page A27, A28)	700	1030

* REFERS TO SPECIFIC APPENDIX PAGE IN ENG. CATALOG FOR UNIT DETAILS. FIELD ASSEMBLY REQUIRED ON ALL CURBS.
NOTE: FOR HEAT RECOVERY CURBS, REFER TO OPTIONS 'C' • 'K' • 'E' • 'M' • 'H' OR 'P'.

ALL CURBS ARE CONSTRUCTED OF 14 Ga. GALVANIZED STEEL.
FOR CURB DIMENSIONS AND DETAILS REFER TO APPENDIX PAGES.

IMPORTANT ! 2" RUBBER VIBRATION ISOLATOR GASKET IS SUPPLIED WITH UNIT & IS LOCATED IN THE UNIT CONTROL SECTION & MUST BE FIELD INSTALLED ON THE CURB BEFORE SETTING THE UNIT.

ADDITIONAL ACCESSORIES

PART No.	DESCRIPTION
K00126	Optional Duct Support Rails (KIT) (For use with knockdown curbs ONLY)

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AIR-CONDITIONING & REFRIGERATION INSTITUTE

A Participating Company in the ARI Certification Programs. Models Listed Above 250,000 Btu/h are Rated in Accordance With ARI Standard 360.

LISTED ETL

All models are certified by ETL in accordance with UL-1995: Standard for Safety, Heating and Cooling Equipment, and ANSI Standard Z21.47.

9-99

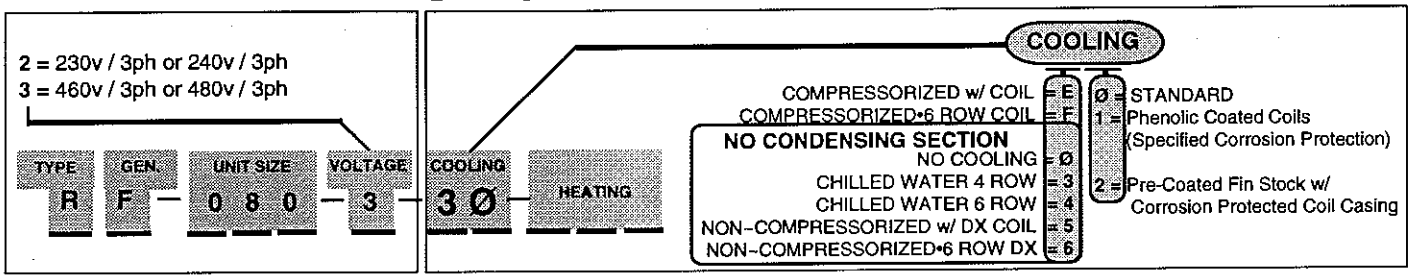
specifications

UNIT FEATURES		UNIT SIZE					
		040	050	060	070	080	090
NOMINAL CAPACITY TONS		40	50	60	70	80	90
REFRIGERANT CHARGE - No. of systems total lbs. / (Lead / Lag)		4 17.5 / 17.5	4 28.0 / 28.0	4 31.5 / 27.0	4 32.5 / 27.0	6 27.0 / 24.0	
COMPRESSORS - (SCROLL) - QUANTITY		4				6	
CONDENSER COIL - QTY. Face Area Sq. Ft. / Rows / Fins per inch		2 62 / 3 / 14	4 125 / 3 / 16			6 125 / 4 / 12	
CONDENSER FANS - QTY. / DIAMETER		2 / 36"			3 / 36"		4 / 36"
CONDENSER FAN MOTORS - HP / RPM EACH		2 / 1140	3 / 1140				
EVAPORATOR COIL - QTY. • Standard • Face Area Sq. Ft. / Rows / Fins per inch		2 45 / 4 / 12	2 51 / 4 / 12	2 51 / 6 / 12	2 58 / 6 / 12	3 67 / 6 / 12	3 67 / 6 / 12
EVAPORATOR COIL - QTY. • 6 Row • Face Area Sq. Ft. / Rows / Fins per inch		2 45 / 6 / 12	2 51 / 6 / 12		6 ROW STANDARD		
EVAPORATOR BLOWER • BELT DRIVE QTY / Wheel Dia. / Type		1 / 37.0 / AIRFOIL			1 / 45.0 / AIRFOIL		
EVAP. BLOWER MOTOR	HP - Standard	10	15		20		30
	HP - Oversize	15	20		30		40
	HP - Double Oversize	20	30		40		50
GAS FURNACES • TYPE		STAINLESS STEEL • TUBULAR • INDUCED DRAFT ELECTRONIC IGNITION - AUTO SPRARK RELIGHT					
GAS CONNECTION (F.P.T.)		2"					
FILTERS - STANDARD 2" PLEATED • Optional 4" • Qty. / Size		(16) 20" x 25"				(30) 20" x 25"	
POWER EXHAUST	PROPELLER FAN(S) QTY / Prop Dia. / RPM	(1) or (2) 36" DIRECT DRIVE • 1140 RPM •					
	MOTOR HP - Standard	(1) @ 3 HP					
	MOTOR HP - Optional	(2) @ 3 HP					
	PLENUM FAN(S) QTY / Prop Dia. / TYPE	(2) / 27" / BI					
	MOTOR HP - Standard	(2) @ 5 HP					
	MOTOR HP - Optional	(2) @ 10 HP					
POWER RETURN / EXHAUST • BELT DRIVE Qty. / Wheel Dia. / Type		1 / 37.0 / AIRFOIL			1 / 45.0 / AIRFOIL		
POWER EXH. MOTOR	HP - Standard	7.5	10		15		20
	HP - Oversize	10	15		20		30
	HP - Dble. Oversize	15	20		30		40
UNIT NET WEIGHTS		**40**	**50**	**60**	**70**	**80**	**90**
BASE UNIT (Cooling Only)		9500	10,300	10,300	10,700	11,800	12,000
GAS Heat Exchanger		850	850	900	900	900	900
ELECTRIC HEAT		400	400	400	400	400	400
HOT WATER OR STEAM COIL		250	250	250	250	250	250
ECONOMIZER		260	260	260	260	260	260
POWER RETURN		3300	3300	3300	3400	3500	3600
POWER EXHAUST		1900					
HEATWHEEL 0 - 12,000 CFM / 12,000 - 18,000 CFM		4000 / 4800					
6 FT. EXTENSION - RETURN SECTION		1600					
8 FT. OPTIONAL ACCESSORY BOX SECTION		1900 (weight DOES NOT include customer added equipment.)					

specifications

UNIT FEATURES		UNIT SIZE		
		110	120	130
NOMINAL CAPACITY TONS		110	120	130
REFRIGERANT CHARGE -	No. of systems	8	8	8
	total lbs. / (Lead / Lag)	31.0 / 27.5	31.0 / 27.5	30.5 / 26.5
COMPRESSORS - (SCROLL) - QUANTITY		8		
CONDENSER COIL - QTY. Face Area Sq. Ft. / Rows / Fins per inch		8 251 / 3 / 16		
CONDENSER FANS - QTY. / DIAMETER		4 / 36"		
CONDENSER FAN MOTORS - HP / RPM EACH		3 / 1140		
EVAPORATOR COIL - QTY. • Standard • Face Area Sq. Ft. / Rows / Fins per inch		4 77.5 / 6 / 12		
EVAPORATOR BLOWER • BELT DRIVE QTY / Wheel Dia. / Type		1 / 49.0 / AIRFOIL		
EVAP. BLOWER MOTOR	HP - Standard	40		50
	HP - Oversize	50		60
	HP - Double Oversize	60		75
GAS FURNACES • TYPE		STAINLESS STEEL • TUBULAR • INDUCED DRAFT ELECTRONIC IGNITION - AUTO SPRARK RELIGHT		
GAS CONNECTION (F.P.T.)		2"		
FILTERS - STANDARD 2" PLEATED • Optional 4" • Qty. / Size		(30) 20" x 25"		
POWER EXHAUST	PROPELLER FAN(S) QTY / Prop Dia. / RPM	(1) or (2) 36" DIRECT DRIVE • 1140 RPM •		
	MOTOR HP - Standard	(1) @ 3 HP		
	MOTOR HP - Optional	(2) @ 3 HP		
	PLENUM FAN(S) QTY / Prop Dia. / TYPE	(2) / 27" / BI		
	MOTOR HP - Standard	(2) @ 5 HP		
	MOTOR HP - Optional	(2) @ 10 HP		
POWER RETURN / EXHAUST • BELT DRIVE Qty. / Wheel Dia. / Type		1 / 49.0 / AIRFOIL		
POWER EXH. MOTOR	HP - Standard	20		30
	HP - Oversize	30		40
	HP - Dble. Oversize	40		50
UNIT NET WEIGHTS		**110**	**120**	**130**
BASE UNIT (Cooling Only)		13,300	13,400	13,600
GAS Heat Exchanger		900	900	900
ELECTRIC HEAT		400	400	400
HOT WATER OR STEAM COIL		250	250	250
ECONOMIZER		260	260	260
POWER RETURN		3600	3700	3800
POWER EXHAUST		1900		
HEATWHEEL 0 - 12,000 CFM / 12,000 - 18,000 CFM		4000 / 4800		
6 FT. EXTENSION - RETURN SECTION		1600		
8 FT. OPTIONAL ACCESSORY BOX SECTION		1900 (weight DOES NOT include customer added equipment.)		

mechanical cooling capacities



GROSS CAPACITIES (MBH) AT ARI RATING CONDITIONS
80°DB / 67°WB Air Entering Evaporator • 95°DB Outside Air

UNIT SIZE	EVAP CFM	Standard Evaporator		6 Row Evaporator	
		Total	Sensible	Total	Sensible
040	20,000	521,437	465,044	525,800	474,290
	16,000	507,321	412,971	510,129	418,355
	12,000	486,961	355,659	489,361	356,667
050	25,000	624,304	547,288	659,976	578,410
	20,000	607,048	487,734	641,238	511,106
	15,000	582,604	422,114	614,152	436,116
	12,000	560,966	377,764	589,326	390,062
060	30,000			744,601	676,640
	24,000			724,696	599,947
	18,000			695,264	509,303
	12,000			644,784	415,863
070	32,000			858,667	756,691
	28,000			843,700	701,223
	21,000			811,220	600,880
	14,000			753,592	489,536
080	36,000			1,019,364	860,028
	32,000			1,003,794	805,497
	24,000			962,109	690,033
	16,000			888,882	566,517
090	36,000	SIX ROW EVAP STANDARD		1,106,265	894,450
	27,000	FOR 60 THROUGH 130 TON UNITS		1,061,544	766,983
	18,000			982,770	628,506
110	50,000			1,390,664	1,181,192
	44,000			1,368,168	1,102,960
	33,000			1,313,208	943,720
	22,000			1,216,440	774,912
120	50,000			1,445,237	1,227,545
	48,000			1,438,004	1,200,724
	36,000			1,382,941	1,027,562
	24,000			1,288,253	838,029
130	50,000			1,563,469	1,264,967
	39,000			1,510,567	1,112,149
	26,000			1,405,652	908,920

Use the AAON furnished PC software selection program for fast and easy unit selection and rating at the specific job design conditions.

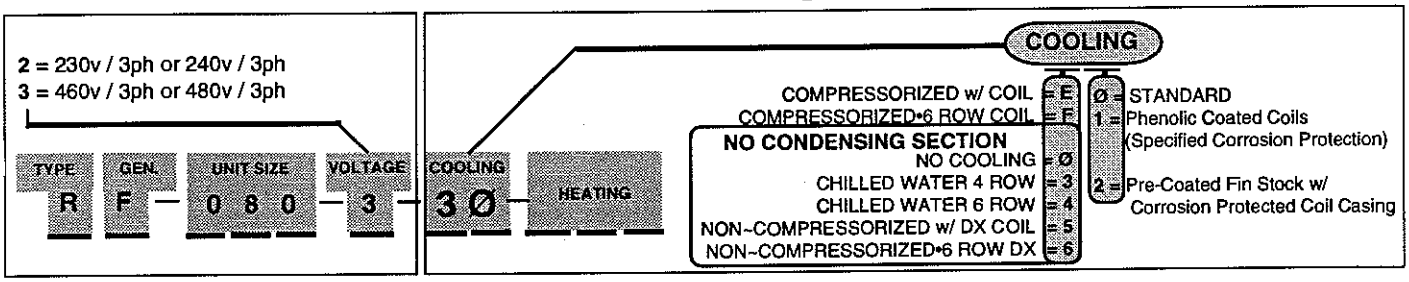


TABLE 5 - 1

STANDARD COIL PHYSICAL DATA* May be used with Heatflow Computer Program Specifications common to all RF chilled water coils.	
Tube Type	1/2"O.D. x 0.017 Wall
Tube Material	COPPER
Wall Thickness	0.017
FINS Per Inch	8
FIN Material	ALUMINUM
FIN Thickness	0.0060
FIN Edge	SINE WAVE

* Special coils are available. Use Tables 5-1 & 5-2 for coil physical data.

TABLE 5 - 2 • COIL SPECIFICATIONS

UNIT SIZE	QTY.	FIN Height	FIN Length	Face Area	Circuits Per Coil	GPM Per Coil Min.	GPM Per Coil Max.
RF 040	2	35	89	21.6	28	17	118
RF 050	2	40	89	24.7	32	19	134
RF 060	2	40	89	24.7	32	19	134
RF 070	2	45	89	27.8	36	22	151
RF 080	3	35	89	21.6	28	17	118
RF 090	3	35	89	21.6	28	17	118
RF 110	4	30	89	18.5	24	14	101
RF 120	4	30	89	18.5	24	14	101
RF 130	4	30	89	18.5	24	14	101

TABLE 5 - 3 • COIL PERFORMANCE • PER SQ.FT. OF FACE AREA FOR A 10° F WATER TEMP. RISE

FACE VELOCITY FPM	Ent. Air Temp. (EAT)°F WB / DB	CAPACITY	4 ROW CHILLED WATER Entering Water Temp.°F (EWT) 43	45	47	6 ROW CHILLED WATER Entering Water Temp.°F (EWT) 43	45	47
550	85 / 70	MBH	18.7	17.0	15.2	25.7	23.6	21.5
		GPM	3.7	3.4	3.0	5.1	4.7	4.3
	80 / 67	MBH	15.1	13.5	12.0	21.2	19.1	17.0
		GPM	3.0	2.7	2.4	4.2	3.8	3.4
	75 / 64	MBH	11.9	10.4	8.7	17.0	14.9	13.0
		GPM	2.4	2.1	1.7	3.4	3.0	2.6
500	85 / 70	MBH	17.6	16.0	14.4	24.1	22.1	20.0
		GPM	3.5	3.2	2.9	4.8	4.4	4.0
	80 / 67	MBH	14.1	12.6	11.3	19.8	17.9	15.9
		GPM	2.8	2.5	2.3	3.9	3.6	3.2
	75 / 64	MBH	11.0	9.7	7.9	15.9	14.0	12.1
		GPM	2.2	1.9	1.6	3.2	2.8	2.4
450	85 / 70	MBH	16.5	14.9	13.4	22.2	20.5	18.6
		GPM	3.3	3.0	2.6	4.4	4.1	3.7
	80 / 67	MBH	13.4	11.9	10.5	18.4	16.6	14.7
		GPM	2.7	2.4	2.1	3.7	3.3	2.9
	75 / 64	MBH	10.5	9.1	7.9	14.6	12.9	11.2
		GPM	2.1	1.8	1.6	2.9	2.6	2.2

(For more detailed selection, use the Heatflow Computer Program)
Use Tables above for physical data.

EXAMPLE:

RF 060 with 4 Row Chilled Water Coil,
EAT 80/67, volume 22,230 CFM, EWT = 45°F.

From Table 5 -2: coil face area is 24.7Ft.Sq. for 2 coils.
Face velocity then is: 22,230 ÷ (24.7 x 2) = 450 FPM.

From Table 5 -3: MBH = 11.9, GPM = 2.4.
TOTAL CAPACITY = 11.9 x 24.7 x 2 = 444.6 with a flow rate of:
2.4 x 24.7 x 2 = 118.6 GPM.

Coil Water Pressure Drop: 118.6 ÷ (32 x 2) = 1.85 Gallon per coil circuit.
From Table 5 -4: 4 Row coil, pressure drop = 4.24 Ft. Water.

TABLE 5 - 4

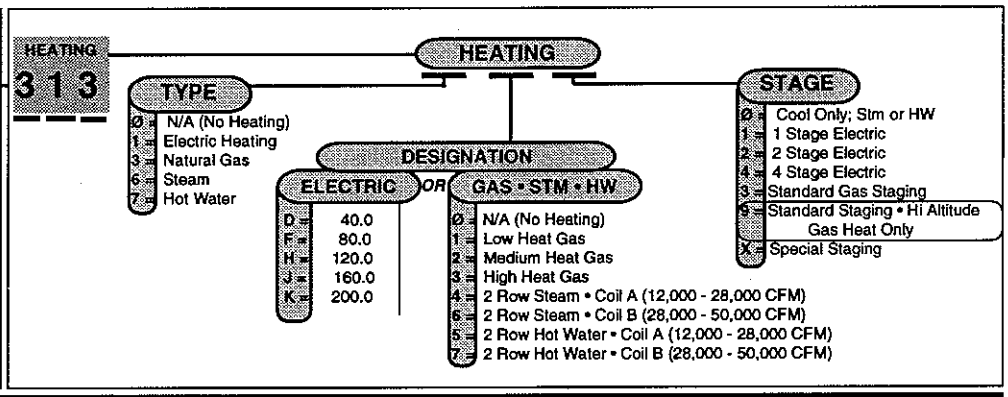
GPM PER CIRCUIT	Press. Drop Water Side 4 ROW	6 ROW
0.60	0.58	0.87
1.00	1.42	2.15
1.40	2.58	3.90
1.80	4.03	6.09
2.20	5.75	8.69
2.60	7.73	11.68
3.00	9.96	15.06
3.40	12.43	18.79
3.80	15.15	22.89
4.20	18.08	27.33

heating selections

TYPE	GEN.	UNIT SIZE	VOLTAGE	COOLING	HEATING
R	F	0 8 0	3	E Ø	3 1 3

GAS HEATING -
STANDARD STAINLESS STEEL HEAT EXCHANGER

NOTE: VAV UNITS WITH HEATING ARE ONE STAGE ONLY. Standard VAV Sequence of Operation Requires Heat For Morning Warm-Up Only.



TYPE HEATING	KW		DESIGNATION
NO HEATING (Cooling Only)	208 / 230v • 460v		- 000 -
ELECTRIC HEATING	30.0 / 40.0 KW		- 1D1 -
	60.1 / 80.0 KW		- 1F2 -
	90.1 / 120.0 KW		- 1H2 -
			- 1H4 -
	120.1 / 160.0 KW		- 1J2 -
			- 1J4 -
	150.2 / 200.0 KW		- 1K2 -
			- 1K4 -
NATURAL GAS HEATING STANDARD GAS STAGING = 2 STAGES / UNIT To Determine Heat Input (MBH) Per Stage, Use The Following Formula: Number of Tubes = Heat Input MBH / 233 MBH For Even Number of Tubes, Staging Will Be Divided Equally. (See Example 1) For Odd Number of Tubes, 1st Stage Will Carry Extra Tube of Heat (See Example 2) Heat Input / Stage = No. of Tubes (233 MBH) **Example 1:** RF-040-3-EØ-313: No. of Tubes = 932 = 4 Tubes 233 Heat Input / 1st Stage = 2 Tubes (233) = 466 MBH Heat Input / 2nd Stage = 2 Tubes (233) = 466 MBH **Example 2:** RF -080-3-EØ-323: No. of Tubes = 1631 = 7 Tubes 233 Heat Input / 1st Stage = 4 Tubes (233) = 932 MBH Heat Input / 2nd Stage = 3 Tubes (233) = 699 MBH IF MORE HEAT CONTROL STAGES ARE REQUIRED, THE MAX. NUMBER OF STAGES EQUALS THE NUMBER OF TUBES OF HEAT. (See Formula Above) **NOTE: Special Control Packages May Determine Stages Of Heat Control. Consult Factory For Special Heat Control Staging.**	UNIT	INPUT MBH	STD. GAS HEAT / HI ALTITUDE
	040	1,398	- 333 - / - 339 -
		1,165	- 323 - / - 329 -
		932	- 313 - / - 319 -
	050	1,398	- 333 - / - 339 -
		1,165	- 323 - / - 329 -
		932	- 313 - / - 319 -
	060	1,864	- 333 - / - 339 -
		1,631	- 323 - / - 329 -
		1,165	- 313 - / - 319 -
	070	1,864	- 333 - / - 339 -
		1,631	- 323 - / - 329 -
		1,165	- 313 - / - 319 -
	080	1,864	- 333 - / - 339 -
		1,631	- 323 - / - 329 -
		1,165	- 313 - / - 319 -
	090	1,864	- 333 - / - 339 -
		1,631	- 323 - / - 329 -
		1,165	- 313 - / - 319 -
	110	1,864	- 333 - / - 339 -
		1,631	- 323 - / - 329 -
		1,398	- 313 - / - 319 -
	120	1,864	- 333 - / - 339 -
		1,631	- 323 - / - 329 -
		1,398	- 313 - / - 319 -
	130	1,864	- 333 - / - 339 -
		1,631	- 323 - / - 329 -
		1,398	- 313 - / - 319 -
STEAM HEATING	COIL 'A' / COIL 'B'		- 640 - / - 660 -
HOT WATER HEATING	COIL 'A' / COIL 'B'		- 750 - / - 770 -

TABLE 7 - 1

electric heating capacities

Heat Designation 040 Through 130	No. of Strips	208 / 60 / 3			230 / 60 / 3			460 / 60 / 3		
		MBH	KW	AMPS	MBH	KW	AMPS	MBH	KW	AMPS
D	1	102.4	30.0	83.3	136.6	40.0	100.4	136.6	40.0	50.2
F	2	205.2	60.1	166.8	273.2	80.0	200.8	273.2	80.0	100.4
H	3	307.7	90.1	250.1	410.1	120.0	301.2	410.1	120.0	150.6
J	4	410.1	120.1	333.4	546.4	160.0	401.6	546.4	160.0	200.8
K	5	512.2	150.2	416.9	683.0	200.0	502.0	683.0	200.0	251.0

NOTE: STANDARD STAGING IS 1 OR 2.
MAXIMUM STAGES OF CONTROL IS EQUAL TO THE NUMBER OF HEAT STRIPS.

TABLE 7 - 2

gas heating capacities

UNIT SIZE	HEATING DESIGNATION	HEATING INPUT (MBH)	OUTPUT CAPACITY (MBH)	TEMPERATURE RISE RANGE (°F)
RF 040	High Heat (3)	1,398	1,062	50 - 80
	Medium Heat (2)	1,165	885	40 - 70
	Low Heat (1)	932	700	30 - 60
RF 050	High Heat (3)	1,398	1,062	40 - 70
	Medium Heat (2)	1,165	885	30 - 60
	Low Heat (1)	932	700	20 - 50
RF060	High Heat (3)	1,864	1,467	50 - 100
	Medium Heat (2)	1,631	1,240	40 - 90
	Low Heat (1)	1,165	885	30 - 70
RF 070	High Heat (3)	1,864	1,467	40 - 90
	Medium Heat (2)	1,631	1,240	35 - 80
	Low Heat (1)	1,165	885	25 - 60
RF 080	High Heat (3)	1,864	1,467	40 - 85
	Medium Heat (2)	1,631	1,240	30 - 70
	Low Heat (1)	1,165	885	20 - 50
RF 090	High Heat (3)	1,864	1,467	40 - 75
	Medium Heat (2)	1,631	1,240	30 - 65
	Low Heat (1)	1,165	885	20 - 50
RF 110	High Heat (3)	1,864	1,467	30 - 65
	Medium Heat (2)	1,631	1,240	25 - 55
	Low Heat (1)	1,398	1,062	20 - 50
RF120	High Heat (3)	1,864	1,467	25 - 55
	Medium Heat (2)	1,631	1,240	20 - 50
	Low Heat (1)	1,398	1,062	20 - 50
RF 130	High Heat (3)	1,864	1,467	25 - 45
	Medium Heat (2)	1,631	1,240	20 - 50
	Low Heat (1)	1,398	1,062	20 - 50

TABLE 7-3 Specific Wt. of Air at Altitude (Std. Conditions)

ALTITUDE	Barometric Press. (In. HG)	Specific Wt.Of Air
- 0 -	29.92	0.0752
1000	28.86	0.0723
2000	27.82	0.0697
3000	26.81	0.0672
4000	25.84	0.0648
5000	24.89	0.0624
6000	23.98	0.0601
7000	23.09	0.0579
8000	22.20	0.0537

NOTES:
1) To calculate air temperature rise: ΔT = Output capacity / (CFM x 1.085)
2) Use tabulated ratings for elevations to 2000 Ft.
3) For elevations above 2000 Ft. derate 4% for each 1000 Ft. above sea level and use the following formula:
   ΔT = Output capacity / (.24 x 60 x specific WT of air x CFM)
   (Refer to Table 7-3 for information about Specific Weight of Air)
4) Gas pressure supply range (inches WG): Natural Gas 6 - 10.5.
5) Gas manifold pressure (inches WG): Natural Gas 3.5.
6) Above 2000 Ft.; Specify "HI ALTITUDE KIT".

CAUTION: FOR APPLICATIONS OUTSIDE THE TEMPERATURE RANGE SHOWN, CONTACT THE FACTORY.

9-99

steam heating data

TABLE 8 - 1 • FACE VELOCITY vs. SELECTION FACTOR

FV (fpm)	SF	ΔP AIR (in. WC)
400	.508	.082
450	.488	.101
500	.471	.122
550	.456	.145
600	.442	.169
650	.428	.194
700	.416	.222
750	.405	.250
800	.395	.281
850	.385	.313
900	.376	.346
950	.367	.381
1000	.359	.417
1250	.325	.619
1500	.297	.855
1750	.275	1.124
2000	.256	1.424
2250	.241	1.755

TABLE 8 - 2

SATURATED STEAM PROPERTIES		
PSIG	TEMPERATURE	LATENT HEAT
2	218	966
5	227	961
7	233	958
10	239	953
15	250	946

Max. Steam Pressure 15 PSIG.

TABLE 8 - 3 • STEAM - NON-DISTRIBUTING

COIL PHYSICAL DATA May be used with Heatflow Computer Program		
	COIL 'A' 12,000 - 28,000 CFM	**COIL 'B' 28,000 - 50,000 CFM**
Face Area (Ft^2)	17.4	23.4
No. of Circuits	40	54
Rows Deep	2	2
Tubes High	40	54
Tube Type	1/2"O.D. x 0.035 Wall • Smooth Tube	
FIN Length	50	
FINS Per Inch	7	
FIN Thickness	0.0060	
FIN Material	ALUMINUM	
FIN Surface	SINE WAVE	
FIN Edge	RIPPLED	

EXAMPLE:

What is the Expected Leaving Air Temperature with
2 PSIG Saturated Steam & 14,000 cfm entering at 60°F ?

The coil face velocity is 14,000 cfm ÷ 17.4 = 804 FPM.
From Table 8 -1: SF = .395 (by interpolation)
From Table 8 -2: SST = 218°F
Temp. Rise = SF(SST - EAT) = .395(218 - 60) = 62.41°F.

CONDENSATE GENERATED

BTUH = 1.085 x CFM x ΔT. Condensate Load = BTUH ÷ Latent Heat @ Operating PSIG.
From Table 8 -2: Latent Heat = 966. Condensate Load = (1.085 x 62.41 x 14,000) ÷ 966 = 981.4 lbs. / hr.
From Table 8 -1: Air Side Pressure Drop = .281 (by interpolation)

hot water coil performance data

TABLE 9-1 • 180° F EWT, 60° F EAT

COIL	C.F.M	ΔP AIR	50 GPM (.6 ft. ΔP)			75 GPM (1.3 ft. ΔP)			100 GPM (2.2 ft. ΔP)			125 GPM (3.3 ft. ΔP)		
			ΔT AIR	ΔT H_2O	MBH	ΔT AIR	ΔT H_2O	MBH	ΔT AIR	ΔT H_2O	MBH	ΔT AIR	ΔT H_2O	MBH
A 17.4 Sq.Ft.	12,000	0.18	41.9	22.3	543	44.6	15.9	578	46.1	12.3	598			
	14,000	0.24	38.8	24.2	587	41.6	17.3	629	43.1	13.4	653			
	16,000	0.30	36.2	25.8	626	39.0	18.5	675	40.6	14.5	702			
	18,000	0.37	34.0	27.2	662	36.8	19.7	716	38.4	15.4	748			
	20,000	0.45	32.1	28.6	694	34.9	20.7	754	36.5	16.2	789			
	22,000	0.53	30.4	29.8	723	33.2	21.7	789	34.8	17.0	828			
	24,000	0.62	28.9	30.9	750	31.7	22.6	822	33.3	17.8	864			
	26,000	0.71	27.6	31.9	774	30.3	23.4	852	31.9	18.5	898			
	28,000	0.81	26.3	32.8	797	29.1	24.2	880	30.7	19.1	929			
B 23.4 Sq.Ft.	28,000	0.48				32.1	26.8	970	34.0	21.4	1036	35.3	17.7	1055
	30,000	0.54				31.0	27.6	1005	32.9	22.0	1068	34.2	18.3	1100
	32,000	0.60				29.9	28.4	1034	31.8	22.6	1100	33.1	18.9	1145
	34,000	0.67				28.9	29.1	1060	30.8	23.3	1131	32.1	19.4	1179
	36,000	0.75				27.9	29.8	1086	29.8	23.9	1160	31.1	19.9	1210
	38,000	0.82				27.0	30.5	1100	28.9	24.4	1188	30.2	20.4	1241
	40,000	0.90				26.2	31.1	1133	28.1	25.0	1214	29.4	20.9	1270
	42,000	0.98				25.4	31.7	1154	27.3	25.5	1240	28.6	21.4	1298
	44,000	1.06				24.7	32.3	1175	26.6	26.0	1264	27.8	21.8	1324
	46,000	1.15				24.0	32.8	1195	25.9	26.5	1287	27.2	22.2	1350
	48,000	1.24				23.4	33.3	1214	25.2	27.0	1309	26.5	22.6	1375
	50,000	1.33				22.8	33.8	1233	24.6	27.4	1331	25.9	23.0	1399

EXAMPLE:

GIVEN: 190°F EWT, 18,000 CFM and 100 GPM, calculate capacity and ΔT H_2O and ΔT AIR. From Table 9-1, a 18,000 CFM and 100 GPM capacity is 748 MBH. From Table 9-2, look-up correction factor for 190°F EWT and 60°F EAT, the correction factor is 1.08. Calculate new capacity as follows: 1.08 x 748 = 807.48 MBH.

$$\textbf{NEW } \Delta T\ H_2O = \frac{\text{Capacity}}{(500)(GPM)} = \frac{807{,}480}{(500)(100)} = 16.2°F \qquad \textbf{NEW } \Delta T\ AIR = \frac{\text{Capacity}}{(1.08)(CFM)} = \frac{807{,}480}{(1.08)(18{,}000)} = 41.5°F$$

TABLE 9-2

CORRECTION FACTORS For Other Than 180°F HW & 60°F Air							
AIR TEMP.	WATER TEMPERATURE						
	210	200	190	180	170	160	150
50°	1.38	1.28	1.18	1.08	1.00	0.90	0.82
60°	1.28	1.18	1.08	1.00	0.90	0.82	0.72
70°	1.18	1.08	1.00	0.90	0.82	0.72	0.64

TABLE 9-3

COIL PHYSICAL DATA May be used with the Heatflow Computer Program		
	COIL 'A' 12,000 - 28,000 CFM	COIL 'B' 28,000 - 50,000 CFM
Face Area (Ft^2)	17.4	23.4
No. of Circuits	40	54
Rows Deep	2	2
Tubes High	40	54
Tube Type	1/2"O.D. x 0.025 Wall • Smooth Tube	
FIN Length	50	
FINS Per Inch	6	
FIN Thickness	0.0060	
FIN Material	ALUMINUM	
FIN Surface	SINE WAVE	
FIN Edge	RIPPLED	

coil static pressure drops (in. wg.)

TABLE 10 - 1

CFM	40 TON				50 TON				60 TON	
	STANDARD COIL		6 ROW COIL		STANDARD COIL		6 ROW COIL		STANDARD 6 ROW COIL	
	WET	DRY	WET	DRY	WET	DRY	WET	DRY	WET	DRY
12,000	.143	.104	.213	.155	.113	.082	.168	.123	.168	.123
14,000	.189	.137	.280	.204	.149	.108	.221	.161	.221	.161
16,000	.239	.174	.355	.258	.189	.137	.280	.204	.280	.204
18,000	.294	.214	.438	.318	.232	.169	.345	.251	.345	.251
20,000	.355	.258	.527	.384	.280	.204	.416	.303	.416	.303
22,000					.331	.241	.493	.359	.493	.359
24,000					.387	.281	.575	.418	.575	.418
26,000					.446	.324	.663	.482	.663	.482
28,000									.756	.550
30,000									.854	.621
32,000									.957	.697

TABLE 10 - 2

CFM	70 TON		80 TON		90 TON	
	STANDARD 6 ROW COIL		STANDARD 6 ROW COIL		STANDARD 6 ROW COIL	
	WET	DRY	WET	DRY	WET	DRY
14,000	.180	.131				
16,000	.228	.166	.173	.126		
18,000	.280	.204	.213	.155	.213	.155
20,000	.338	.246	.257	.187	.257	.187
22,000	.440	.291	.304	.221	.304	.221
24,000	.467	.340	.358	.258	.358	.258
26,000	.538	.391	.409	.298	.409	.298
28,000	.613	.446	.467	.340	.467	.340
30,000	.693	.504	.527	.384	.527	.384
32,000	.777	.565	.591	.430	.591	.430
34,000	.865	.630	.658	.475	.658	.475
36,000			.729	.530	.729	.530
38,000			.802	.583	.802	.583

TABLE 10 - 3

CFM	110 TON		120 TON		130 TON	
	STANDARD 6 ROW COIL		STANDARD 6 ROW COIL		STANDARD 6 ROW COIL	
	WET	DRY	WET	DRY	WET	DRY
22,000	.240	.175				
24,000	.280	.204	.280	.204		
26,000	.323	.235	.323	.235		
28,000	.368	.268	.368	.268	.368	.268
30,000	.416	.303	.416	.303	.416	.303
32,000	.467	.340	.467	.340	.467	.340
34,000	.520	.378	.520	.378	.520	.378
36,000	.575	.418	.575	.418	.575	.418
38,000	.633	.460	.633	.460	.633	.460
40,000	.693	.504	.693	.504	.693	.504
42,000	.756	.550	.756	.550	.756	.550
44,000	.821	.597	.821	.597	.821	.597
46,000	.888	.646	.888	.646	.888	.646
48,000	.957	.697	.957	.697	.957	.697
50,000	1.029	.749	1.029	.749	1.029	.749

component static pressure drops (in. wg.)

TABLE 11 - 1

CFM 40-130	HEATING SECTION								R/A SECTION
	GAS HEAT			ELECTRIC HEAT					ECONOMIZER
	HIGH	MEDIUM	LOW	D (40kw)	F (80kw)	H (120kw)	J (160kw)	K (200kw)	100% R/A
12,000	.182	.170	.114	.048	.060	.080	.120	.159	.08
14,000	.209	.196	.131	.054	.068	.090	.135	.180	.09
16,000	.236	.221	.147	.060	.075	.100	.151	.200	.09
18,000	.262	.246	.164	.066	.083	.110	.165	.220	.10
20,000	.288	.270	.180	.072	.090	.120	.180	.239	.11
22,000	.314	.294	.196	.078	.097	.130	.194	.258	.12
24,000	.339	.318	.212	.083	.104	.139	.208	.277	.13
26,000	.365	.342	.228	.089	.111	.148	.222	.295	.13
28,000	.390	.365	.244	.094	.118	.157	.236	.313	.14
30,000	.415	.389	.259	.100	.124	.166	.249	.331	.15
32,000	.440	.412	.275	.105	.131	.175	.262	.349	.15
34,000	.464	.435	.290	.110	.138	.183	.275	.366	.16
36,000	.489	.458	.306	.115	.144	.192	.288	.383	.17
38,000	.513	.481	.321	.120	.150	.201	.301	.400	.17
40,000	.537	.504	.336	.125	.157	.209	.313	.417	.18
42,000	.562	.526	.351	.130	.163	.217	.326	.433	.19
44,000	.586	.549	.366	.135	.169	.225	.338	.450	.19
46,000	.609	.571	.381	.140	.175	.234	.350	.466	.20
48,000	.633	.594	.396	.145	.181	.242	.363	.482	.20
50,000	.657	.616	.411	.150	.187	.250	.375	.498	.21

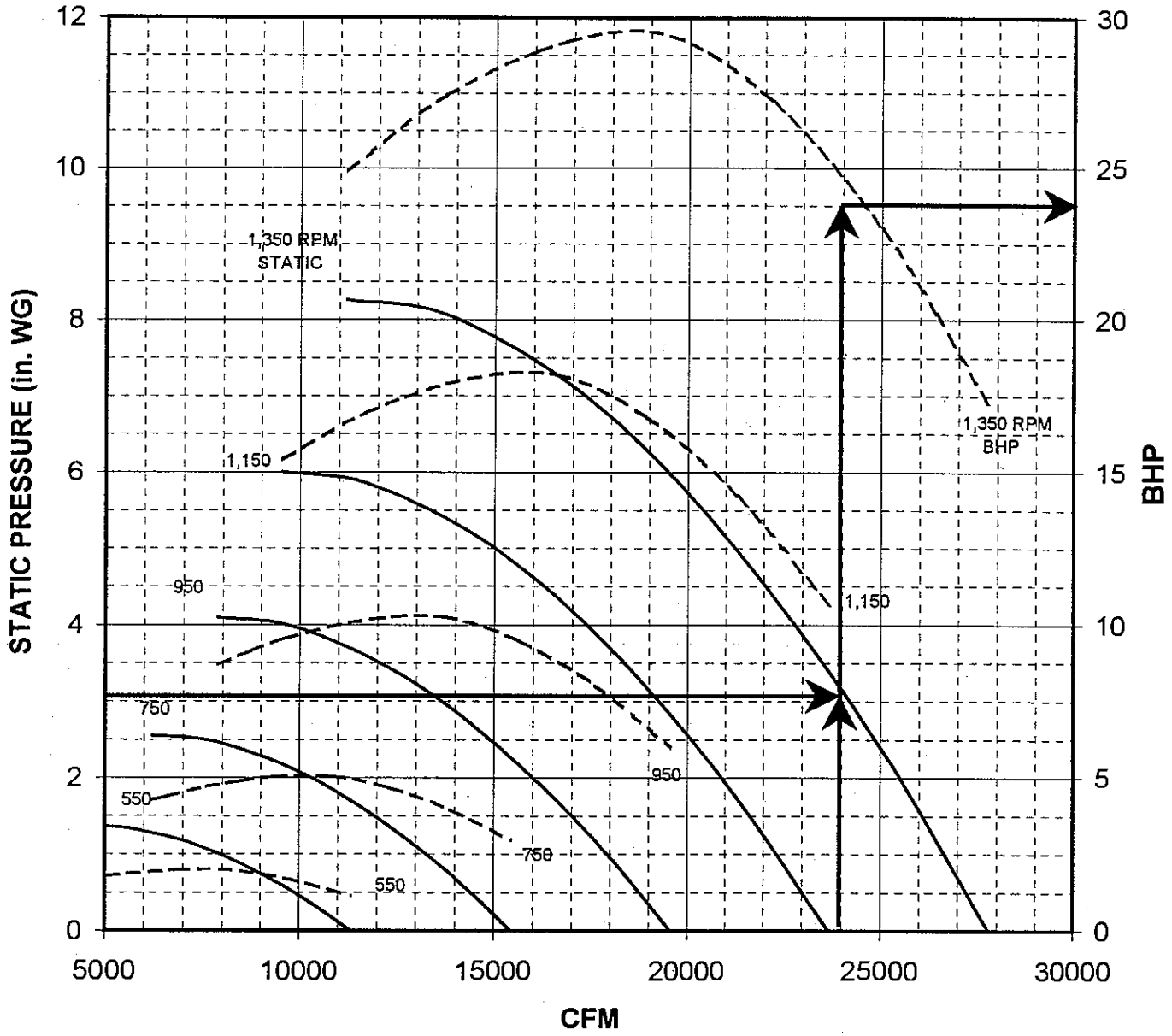
filter static pressure drops (in. wg.)

TABLE 11 - 2

CFM 40-130	FILTER SECTION							
	RF 40 - 80				RF 90 - 130			
	2" Permanent	2" Pleated	4" Pleated	12" Cartridge*	2" Permanent	2" Pleated	4" Pleated	12" Cartridge*
12,000	.025	.036	.032	.071				
14,000	.034	.049	.043	.097				
16,000	.044	.063	.056	.126				
18,000	.056	.080	.071	.160				
20,000	.069	.099	.088	.197	.031	.044	.039	.088
22,000	.084	.120	.106	.238	.037	.053	.047	.106
24,000	.100	.143	.126	.284	.044	.063	.056	.126
26,000	.117	.167	.148	.333	.052	.074	.066	.148
28,000	.136	.194	.172	.386	.060	.086	.076	.172
30,000	.156	.223	.197	.443	.069	.099	.088	.197
32,000	.178	.254	.224	.504	.079	.113	.100	.224
34,000	.200	.286	.253	.569	.089	.127	.112	.253
36,000	.225	.321	.284	.638	.100	.143	.126	.284
38,000	.250	.358	.316	.711	.111	.159	.140	.316
40,000					.123	.176	.156	.350
42,000					.136	.194	.172	.386
44,000					.149	.213	.188	.424
46,000					.163	.233	.206	.463
48,000					.178	.254	.224	.504
50,000					.193	.275	.243	.547

*** 12" Cartridge Filter Option Includes 4" Pre-filters.**

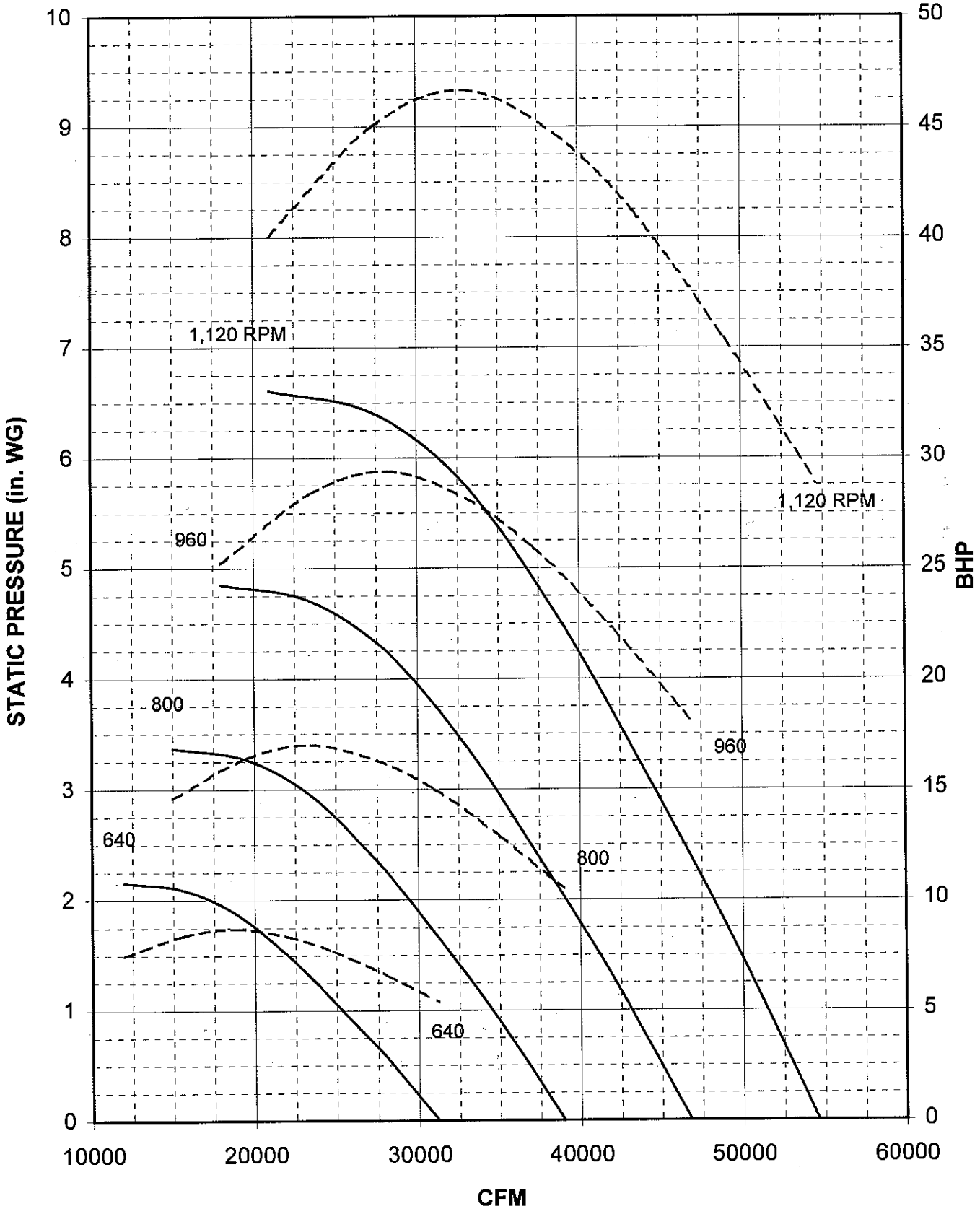
RF 40 - 60 ton • 370 plenum fan
supply or return fan performance



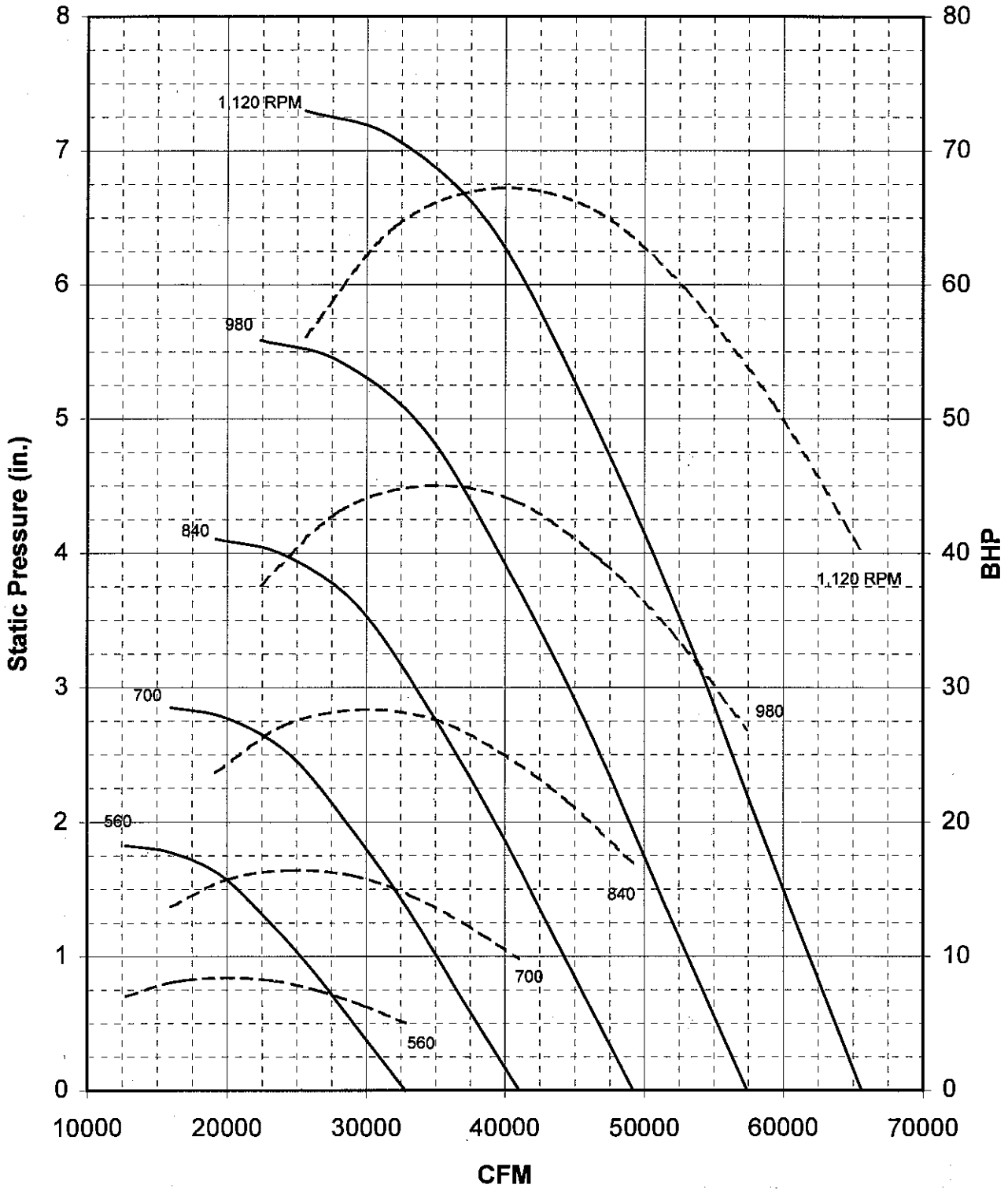
EXAMPLE:

Find the RPM and BHP for a fan operating at 24,000 cfm and 3.0" w.c. TSP. Follow a line vertically from 24,000 cfm to a horizontal line from 3.0" w.c. Where these two lines intersect, interpolate between the 1,150 and 1,350 rpm performance curves to get 1,300 rpm. Follow the 24,000 cfm vertical line until it intersects a curve representing 1,300 rpm for the horsepower curve. From this intersection, follow a horizontal line to the right and read the BHP of 24 BHP.

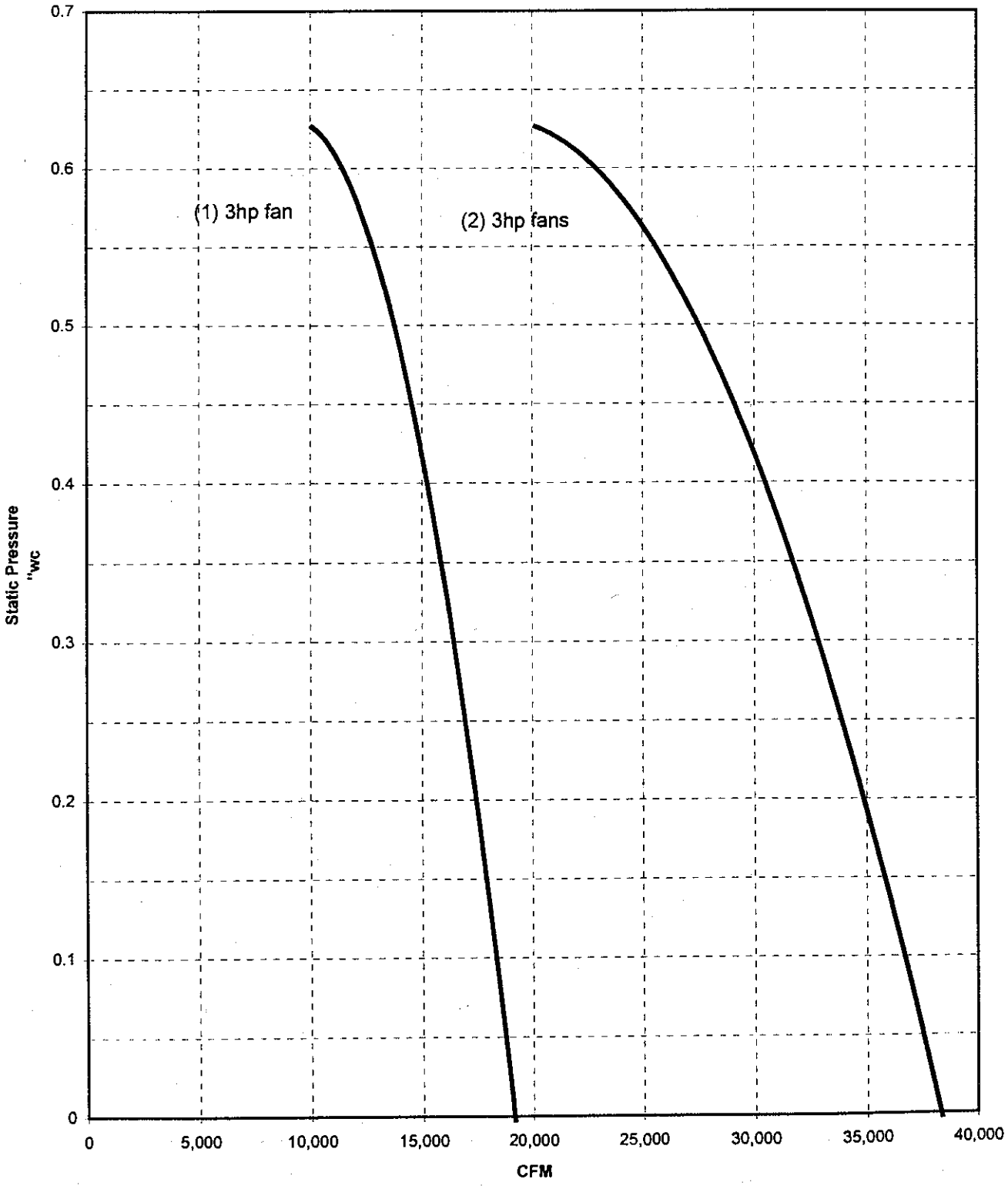
RF 70 - 90 ton • 450 plenum fan
supply or return fan performance



RF110 - 130 ton • 490 plenum fan
supply or return fan performance

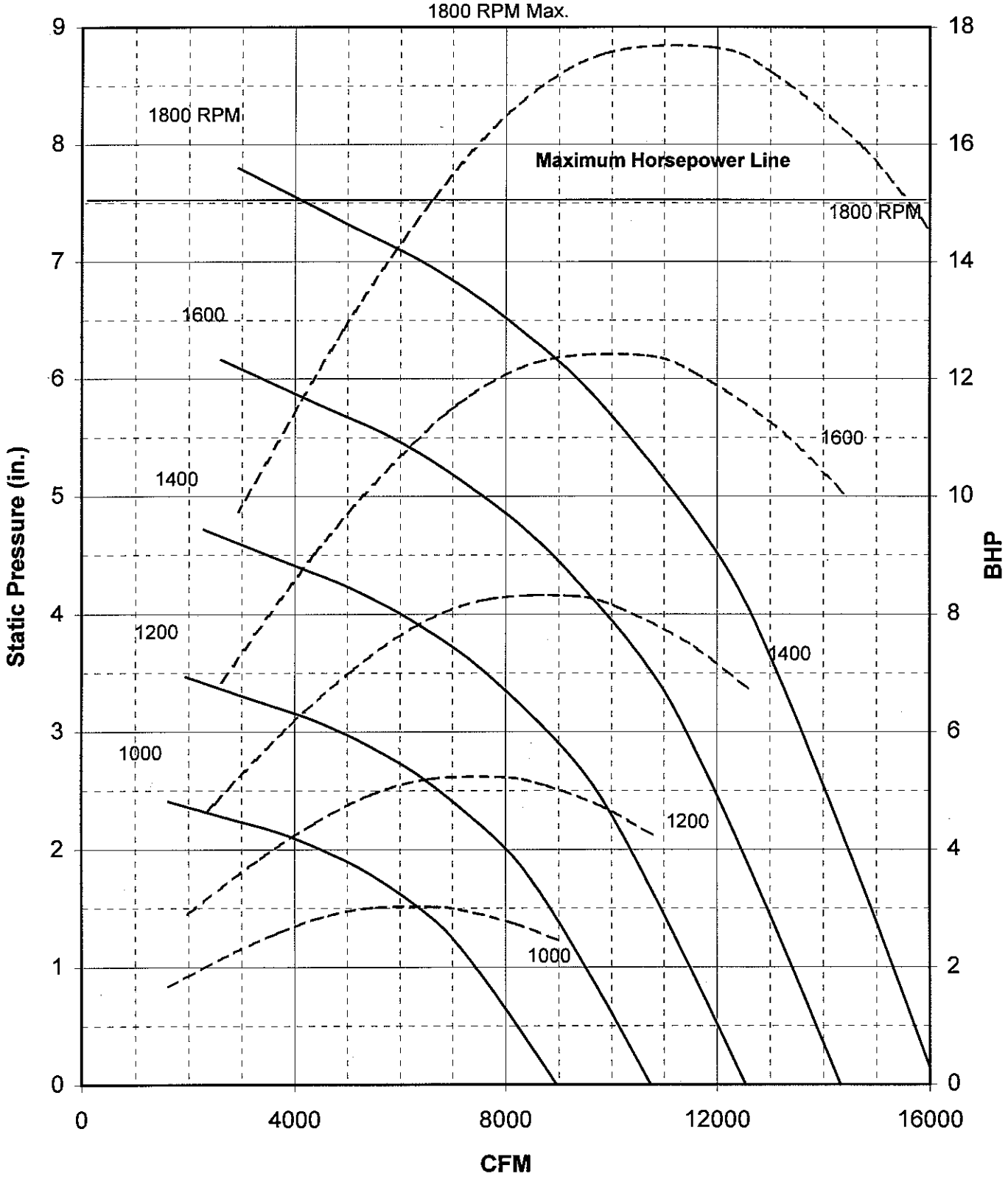


RF propeller exhaust performance



RF power exhaust fan performance

(Table shown is for one fan--for two fan arrangement, multiply CFM by 2)



The problem - Indoor Air Quality

Indoor air quality has long been a topic for debate. We all know of the sick building syndrome and of how stuffy and smelly a room can get after a long period of occupation. After extensive research, ASHRAE revised its ventilation standards with ASHRAE 62-1989.
With the introduction of ventilation standard ASHRAE 62-1989, there was a major revision in the ventilation required for buildings. Since its introduction, the standard has been adopted by ANSI and by many state building codes.
The result of these sweeping changes is that in new or renovated buildings much more outside air has to be introduced to meet the standard and maintain the level of indoor air quality. HVAC systems now see more load due to ventilation. In most cases, simply increasing the amount of outside air would substantially increase the size and operating cost of the system.

The solution - Indoor Air Quality

Increased HVAC system capacity is one obvious solution to this change. The problem with this solution is that the size of HVAC equipment must increase to handle the extremes of the building load. The increase in tonnage is only used at maximum design and in many parts of the USA, most of that tonnage is used to remove moisture from the outside air before entering the building. First cost and running cost increase quite dramatically!

A better idea. By capturing and using the exhaust air stream and utilizing the difference between it and the outside air, energy use can be avoided and equipment can be down sized compared to conventional approaches to HVAC equipment. If you ventilate, you must exhaust the air; air that you have already paid to be treated which is discarded to the outside either through leakage in the building and/or through exhaust. If you exhaust, you should salvage the energy available in that air during both cooling and heating.

The problem - Indoor Humidity Control

Increased ventilation increases the amount of humidity introduced into the building. In most HVAC equipment, once the space temperature is satisfied the cooling system is shut off, yet air is still being introduced to the space to satisfy ventilation requirements!
Often, the outside moisture level is significantly greater than the indoor moisture level. This results in large quantities of moisture being introduced into the building causing the humidity level of the space to go out of control.

The solution - Indoor Humidity Control

By capturing and using the exhaust air stream and utilizing the difference between it and the outside air, latent energy (moisture) can be transferred from the outside air to the exhaust air, thus minimizing the effect of outside air moisture in the building. The result is much better humidity control of the space.

Here's how the AAON solution works

AAON has taken an already proven design and developed an energy recovery option (see the unit drawings). The heat recovery option utilizes a total energy wheel which transfers energy between room air exhaust and outside air. Both sensible and latent (moisture) heat is transferred, thereby reducing the summer cooling load and the winter heating load.

Some of the features of the energy recovery option are:
- Total energy recovery heat wheel transferring both latent and sensible heat.
- Easy service of the heat wheel.
- 4 inch outside air filters.
- Exhaust backdraft damper.
- Available economizer option.
- Outside air/return air balancing dampers - motorized to isolate the outside air during periods of off cycle.

Heat Recovery Cont.

Heat Recovery Specifications

CFM	0 - 12,000	12,000 - 24,000
Wheel Dia. (inches)	(1) 74"	(2) 74"
Exhaust Fan	(1) 27"	(2) 27"
Standard HP	5	5
Oversize HP	10	10
Outside Air Filter	(12) 16 x 20 x 4	(16) 16 x 20 x 4
Heat Wheel Motor Voltage Amps	(1) 1/4 HP 208/230-460 1.3 / 1.2 - 0.6	(2) 1/4HP 208/230-460 1.3 / 1.2 - 0.6
Cassette Wt. (lbs.)	450	900
Option Wt. (lbs.)	4000	4800

Notes:
To obtain the weight of the complete unit add the above weight to the appropriate RF unit.
In the RF product, the heat recovery option replaces the power return section.
All components in the supply air section remain unchanged.

APPLICATION EXAMPLE

Consider the flow and psychrometrics of a 40-ton unit with a heatwheel option operating in St. Louis, MO.

The unit is delivering 16,000 cfm to the space with 6000 cfm of outside air (38% outside air). There is 6000 cfm of exhaust air from the space with 10,000 cfm recirculated. With 95°/75° outside air (OA) and 75°/61° exhaust air (RA), the heatwheel cools the outside air to 79.1°/64.3° $(AW)^2$. When mixed with the 10,000 cfm of recirculated air, the air entering the evaporator coil is 76.6°/62.2° (MA) (the moisture content at this point is almost 1/3 lower than the outside air). Using the performance tables from this catalog or the electronic program for a 40 ton unit, the leaving air from the unit is 57.0°/53.5° (SA) with a total capacity of 646.8 MBH and a sensible capacity of 449.6 MBH.

Note, with the addition of a heatwheel, we have a 40 ton unit performing 53.8 tons of cooling! (the heatwheel contributes 243.0 MBH total and 103.2 MBH sensible).

The same unit as above operating in the winter time recovers 335.6 MBH of sensible energy which would normally be lost. Some moisture is captured for a total energy of 504.6 MBH.

Note the first cost savings due to the reduced unit size and the year round continuing energy savings that are accomplished in all future years with the use of the AAONAIRE energy recovery heatwheel.

AAONAIRE® Heatwheel Performance Calculation

It is faster and easier to use the AAON, Inc. furnished PC software for equipment selection, as well as, the unit and heatwheel performance data. The following is presented for your information.

Effectiveness (as defined by ASHRAE) is the amount of energy recovered (i.e., sensible, latent, or enthalpy) divided by the maximum amount that could theoretically be recovered.

Balanced air flow (supply air and exhaust air are equal) — Look up the efficiency (E) from Table 19-1, and read the corresponding value .

To calculate the temperature of air leaving the heat wheel (*tsa(db)*).

tsa(db)=toa(db) - E [toa(db)-tra(db)].

To calculate the enthalpy of air leaving the heat wheel (*hsa*).

hsa=hoa - E [hoa-hra].

Using a psychrometric chart, lookup the corresponding wet bulb temperature where *tsa(db)* and *hsa* intersect.

Unbalance air flow (supply air and exhaust air are not equal)

Maximum unbalance $\frac{Vmin}{Vmax} \geq 0.8$. Lookup the efficiency (*E*) from Table 19-1, using the *smaller* air flow (*Vmin*).

To calculate the temperature of air leaving the heat wheel (*tsa(db)*).

$$tsa(db)=toa(db) - E \frac{Vmin}{Vmax} [toa(db)-tra(db)].$$

To calculate the enthalpy of air leaving the heat wheel (*hsa*).

$$hsa=hoa - E \frac{Vmin}{Vmax} [hoa-hra].$$

Using a psychrometric chart, lookup the corresponding wet bulb temperature where *tsa(db)* and *hsa* intersect.

Energy recovered

Sensible (btuh) = *Vmax. 1.085 [toa(db)-tsa(db)]*
Latent (btuh) = *Vmax. 4.5 [hoa-hsa]*

Where:

- *Vmin* - *Lowest air volume, usually the exhaust*
- *Vmax* - *Largest air volume, usually the supply*
- *tsa(db)* - *Temperature supply air (from wheel), dry bulb*
- *toa(db)* - *Temperature outside air, dry bulb*
- *tra(db)* - *Temperature return air, dry bulb*
- *hsa* - *Enthalpy supply air, Btu/Lb*
- *hoa* - *Enthalpy outside air, Btu/Lb*
- *hra* - *Enthalpy return air, Btu/Lb*

AAONAIRE® Heatwheel Efficiency & Pressure Drop

TABLE 20 - 1

0 - 12,000 cfm wheel			12,000 - 24,000 cfm wheel		
CFM	EFFICIENCY	In.WC	CFM	EFFICIENCY	In.WC
4000	86.5	.384			
5000	82.5	.486			
6000	79.3	.588			
7000	76.6	.689			
8000	74.4	.791	8000	86.5	.384
9000	72.5	.893	9000	84.5	.435
10000	70.9	.994	10000	82.5	.486
11000	69.4	1.096	11000	80.8	.537
12000	68.1	1.198	12000	79.3	.588
			13000	77.9	.638
			14000	76.6	.689
			15000	75.5	.740
			16000	74.4	.791
			17000	73.4	.842
			18000	72.5	.893
			19000	71.7	.943
			20000	70.9	.994
			22000	69.4	1.096
			24000	68.1	1.198

RF 40 thru 130 Heatwheel Exhaust Performance

Blower performance curves include internal resistance of the cabinet only. For total static pressure determination, system external static pressure must be added to the appropriate heat wheel static pressure drop.

To determine the exhaust blower BHP and RPM, calculate the total static pressure required and the exhaust air volume. Then, use the curves below to lookup the fan RPM and the required motor BHP for the heat recovery option.

TABLE 21 - 1

one 27.0" diameter plenum fan

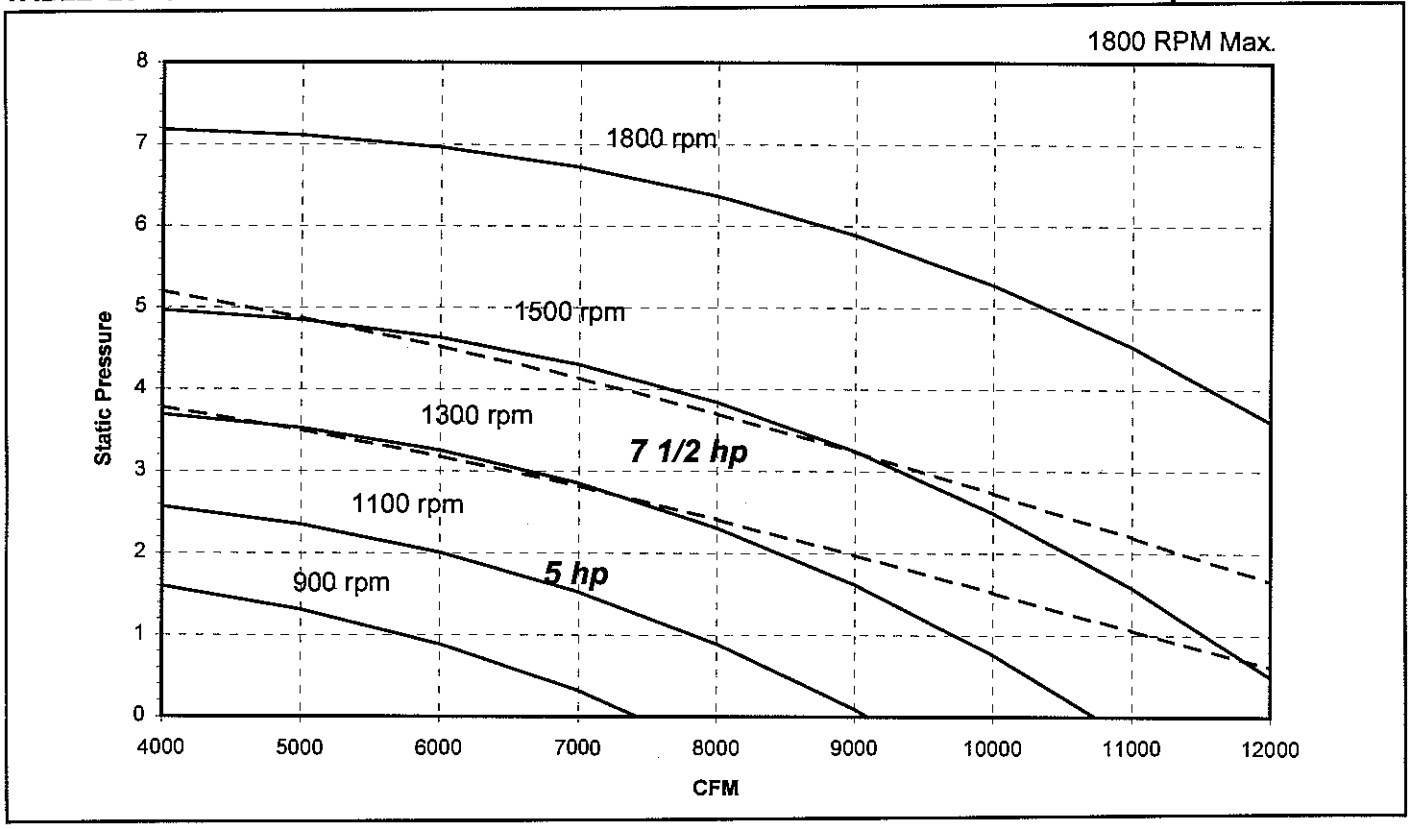
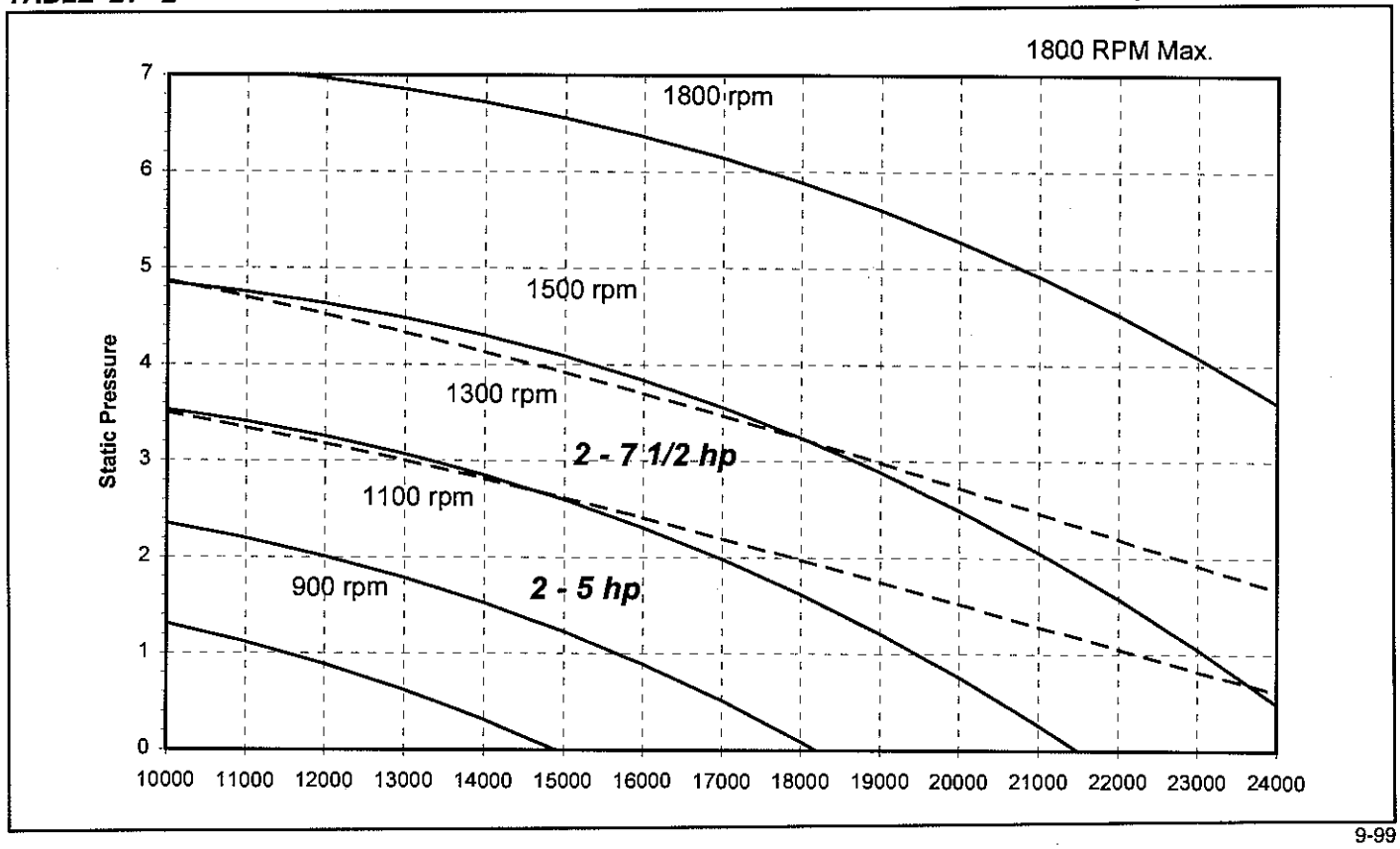


TABLE 21 - 2

two 27.0" diameter plenum fans



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Heat Recovery Cont.

CONTROL STRATEGIES

High latent removal

The units can be run at low air flow (less than 200 cfm/ton) to act as a two stage dehumidifier. First stage is the minimization of outside air humidity load using the heat wheel. The second stage is to run the refrigeration at low air flow to maximize moisture removal.

The unit would primarily operate to satisfy temperature in the space. Once temperature is satisfied, a humidistat would run the compressors for dehumidification if the humidity is too high. If a reheat coil were installed, it would come on with the compressors to minimize overcooling of the space. The reheat coil would cycle off if cooling is called for. Supplemental heating would come on in response to the heating thermostat, which would maintain space temperature.

Standard temperature control

The unit can be configured with normal air flows and controls but still have the benefit of a large amount of makeup air, better humidity control and lower operating cost than a unit without a heat wheel.

OPTIONS

Frost control

The formation of frost on a heat wheel is a function of the available moisture in the exhaust air stream and the outside air temperature. For an exhaust air stream of 30% relative humidity, the frost threshold is 0 deg F outside air temperature. This is the temperature at which frost will start to form on the wheel. At higher exhaust humidities and lower outside air temperatures, the frost threshold will be higher.

During the winter, with outside air below freezing, indoor humidities tend to be low. Because of this, we (AAON) do not feel frost control is necessary in most conditions.
In the event that there will be unusually low outside air temperatures or high exhaust humidities (in excess of 30% RH exhaust combined with outside air temperatures less than 5 deg F), the heatwheel simply stops periodically and uses the exhaust air to remove frost — this would operate on a timer and be activated by outside air temperature.

Economizer

During mild weather, indoor cooling can be accomplished using outside air. A bypass damper around the heat wheel can be opened and 100% outside air introduced into the building.

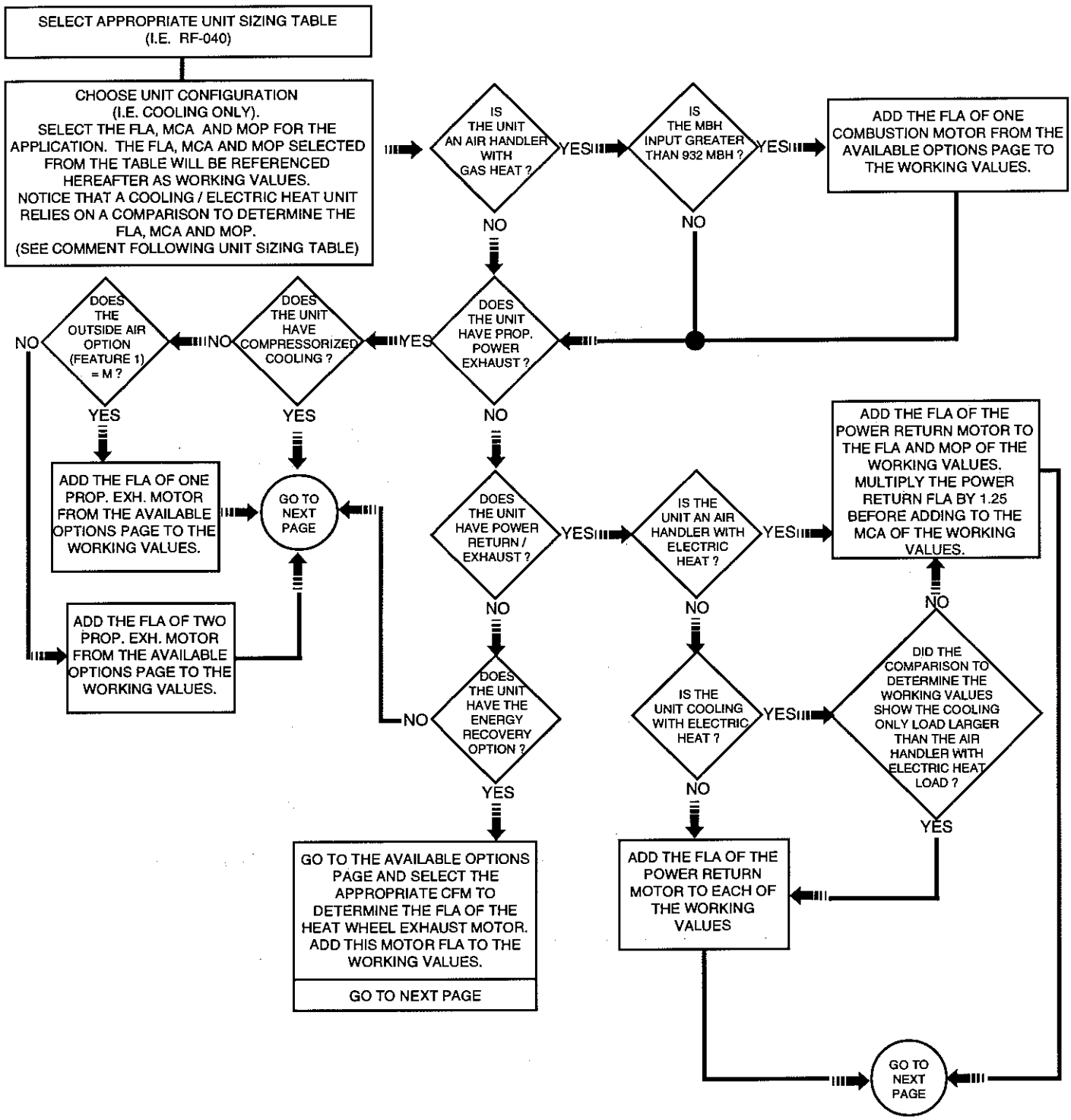
Reheat

In this case, a reheat coil using condenser heat, is added after the evaporator to act as the first stage of heating.

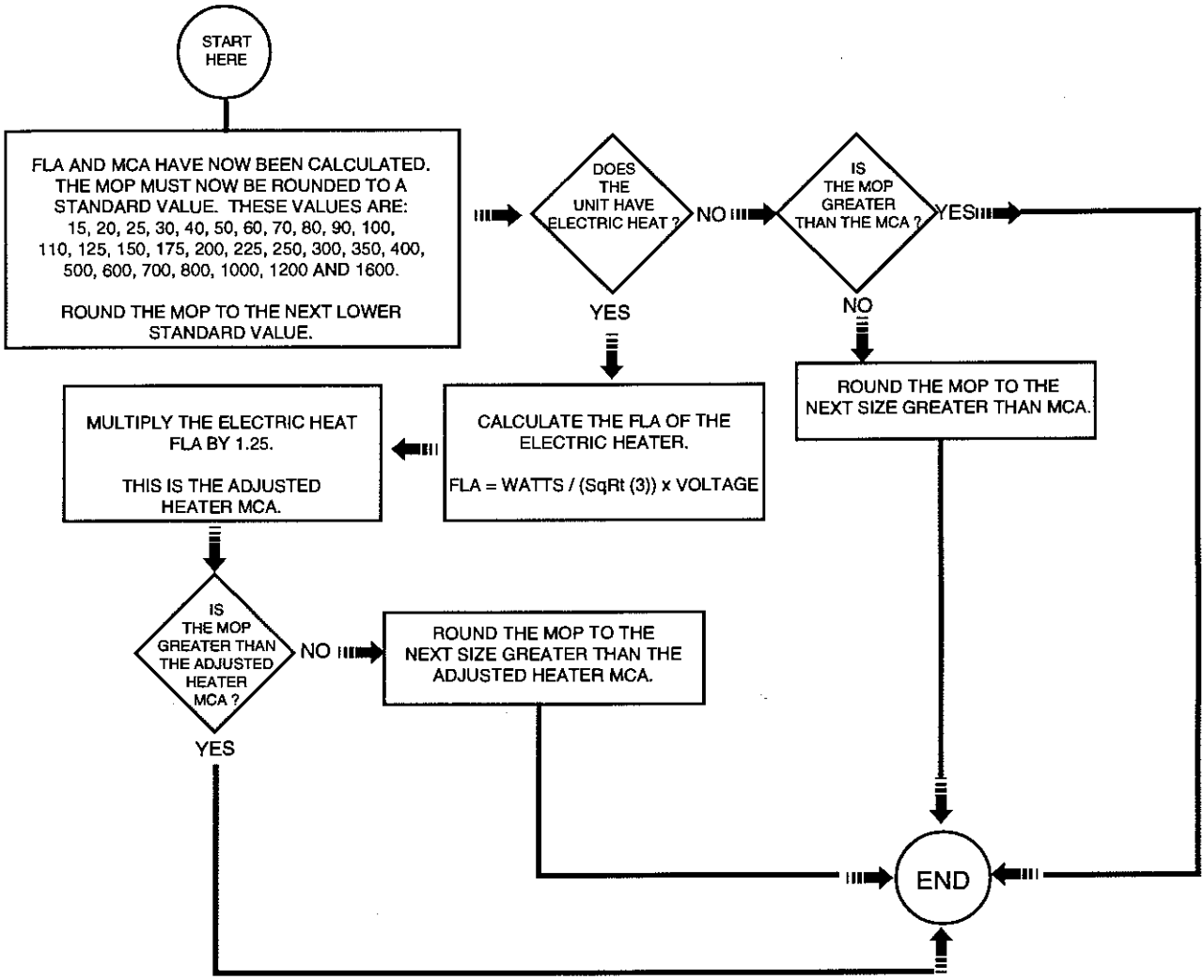
Hot gas bypass

In applications where the unit air flow is low (less than 250 cfm/ton), the use of hot gas bypass is required to prevent the evaporator coil from freezing in conditions of unusually low load.

RF unit electrical data calculation flowchart



RF unit electrical data calculation flowchart (con't.)



electrical calculations

These instructions are used to calculate the FLA, MCA and MOP for a given unit application.

1) Choose unit configuration (i.e. RF 40 ton, cooling with 160kw electric heat) from the unit sizing tables (see following pages). Note the FLA, MCA and MOP values associated with that unit.
Note: If a cooling with electric heat unit is selected, the air handler with electric heat FLA value must be compared with the cooling only FLA value. The largest FLA value will be the basis for unit electrical calculations.

2) Examine the available options sheet to determine if any of the options can be applied to the unit in step 1. Also note if the unit contains a power return option. If the unit configuration does not contain any of the available options, or a power return option, skip to step 4.

3) Add the FLA of each option or power return option selected in step 2 to each of the FLA, MCA and MOP values as determined in step 1.

4) The unit FLA and MCA values have been calculated using either step 2) or 3). To determine the unit MOP value, note the calculated MOP value from step 2) or 3), whichever applies. This value must be rounded down to the next lower standard ampere rating as defined by the National Electric Code (NEC).

   From the NEC Handbook - The standard ampere ratings for fuses shall be considered: 15, 20, 25, 30, 35, 40, 50, 60, 70, 80, 90, 100, 110, 125, 150, 175, 200, 225, 250, 300, 350, 400, 450, 500, 600, 700, 800 and 1000 amperes.

EXCEPTIONS:

a) If the unit contains an electric heater, the MOP shall be the next higher rating if the next lower rating is less than 125% of the electric heat FLA.

b) If the next lower standard rating is less than the calculated MCA for the unit, then round the MOP to the next largest size equal to or larger than the MCA.

example electrical calculation

Determine the unit FLA, MCA and MOP values for a RF 40 ton cooling / 160KW electric heat unit with power return. The unit contains an oversized supply fan motor and a double-oversized power return motor at 460v / 3ph / 60hz power.

1) From the RF 40 ton unit sizing table: The supply fan motor defines which column the data will be retrieved from. Observing the note from step 1 above and at the bottom of the unit sizing tables, a comparison must be made between the cooling only FLA value and the air handler 160 KW electric heat FLA value.

   Cooling Only: FLA = 79.8 A Air Handler / 160 KW: FLA = 221.8 A
   Since the air handler with 160 KW electric FLA is larger, the base working values are:
   Cooling with 160KW electric heat: FLA = 221.8 A MCA = 227.1 A MOP = 248.1 A

2) Examining the available options page reveals that no additional components in the section should be accounted for. However, since this unit contains a double-oversized power return motor, the motor FLA must be added to the unit calculations.

3) From step 2, the double-oversized power return motor has a FLA of 21 A. The new working values are:
   Cooling with 160KW electric heat and double-oversized power return motor:

FLA = 221.8 A + 21.0 A	→	FLA = 242.8 A
MCA = 227.1 A + 21.0 A	→	MCA = 248.1 A
MOP = 248.1 A + 21.0 A	→	MOP = 269.1 A

4) The MOP does not equal a standard rating, therefore it is round down to the next lower rating.
   MOP of 269.1 A (rounds down to 250A).

Check of exception a). The 160KW electric heater at 460v / 3 / 60 power has a FLA of 200.8 A.
125% of the electric heat FLA is 249 A. Since the MOP is greater than 125% of the electric heat FLA, this unit passes the check of exception a).

Check of exception b). Since the MOP is greater than the calculated MCA, this unit passes the check of exception b).

FINAL UNIT ELECTRICAL VALUES: FLA = 243A • MCA = 248A • MOP = 250A

Note that the FLA and MCA values calculated in step 3 were rounded to the nearest whole number.

RF-40		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN MOTOR	(HP)	10	15	20	10	15	20
	FLA	28.0	42.0	54.0	14.0	21.0	27.0
COMPRESSOR 1 & 2	FLA (ea)	28.8			12.8		
	LRA (ea)	260.0			130.0		
COMPRESSOR 3 & 4	FLA (ea)	28.8			12.8		
	LRA (ea)	260.0			130.0		
CONDENSER FAN MOTOR	FLA (ea)	(2) @ 7.4 (2 HP)			(2) @ 3.8 (2 HP)		
POWER RETURN MOTOR	(HP)	7.5	10	15	7.5	10	15
	FLA	22.0	28.0	42.0	11.0	14.0	21.0
NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.							
AIR HANDLER ONLY (NO COMPRESSORS)							
	FLA	28.0	42.0	54.0	14.0	21.0	27.0
	MCA	35.0	52.5	67.5	17.5	26.3	33.8
	**MOP	63.0	94.5	121.5	31.5	47.3	60.8
AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)							
	FLA	30.2	44.2	56.2	15.1	22.1	27.0
	MCA	37.8	55.3	70.3	18.9	27.6	35.1
	**MOP	68.0	99.5	126.5	34.0	49.7	63.2
AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)							
ELEC. HEAT	FLA	128.4	142.4	154.4	64.2	71.2	77.2
	MCA	160.5	178.0	193.0	80.3	89.0	96.5
DESIGNATION "D"	**MOP	163.4	194.9	221.9	81.7	97.5	111.0
ELEC. HEAT	FLA	228.8	242.8	254.8	114.4	121.4	127.4
	MCA	235.8	253.3	268.3	117.9	126.7	134.2
DESIGNATION "F"	**MOP	263.8	295.3	322.3	131.9	147.7	161.2
ELEC. HEAT	FLA	329.2	343.2	355.2	164.6	171.6	177.6
	MCA	336.2	353.7	368.7	168.1	176.9	184.4
DESIGNATION "H"	**MOP	364.2	395.7	422.7	182.1	197.9	211.4
ELEC. HEAT	FLA	429.6	443.6	455.6	214.8	221.8	227.8
	MCA	436.6	454.1	469.1	218.3	227.1	234.6
DESIGNATION "J"	**MOP	464.6	496.1	523.1	232.3	248.1	261.6
ELEC. HEAT	FLA	530.0	544.0	556.0	265.0	272.0	278.0
	MCA	537.0	554.5	569.5	268.5	277.3	284.8
DESIGNATION "K"	**MOP	565.0	596.5	623.5	282.5	298.3	311.8
COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)							
	FLA	158.0	172.0	184.0	72.8	79.8	85.8
	MCA	165.2	182.5	197.5	76.3	85.1	92.6
	**MOP	194.0	224.5	251.5	90.3	106.1	119.6

IF A COOLING WITH ELECTRIC HEAT UNIT IS SELECTED, THEN THE AIR HANDLER WITH ELECTRIC HEAT FLA VALUE MUST BE COMPARED TO THE COOLING ONLY FLA VALUE. THE LARGEST FLA VALUE WILL BE THE BASIS FOR UNIT ELECTRICAL CALCULATIONS.

**** NOTE: MOP VALUES LISTED ON THIS PAGE HAVE NOT BEEN ROUNDED TO THE STANDARD VALUES. CONSULT THE CALCULATION PAGE TO DETERMINE THE ACTUAL VALUES.**

RF-50		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN	(HP)	15	20	30	15	20	30
MOTOR	FLA	42.0	54.0	80.0	21.0	27.0	40.0
COMPRESSOR	FLA (ea)	49.0			24.3		
1 & 2	LRA (ea)	420.0			175.0		
COMPRESSOR	FLA (ea)	32.1			18.6		
3 & 4	LRA (ea)	260.0			130.0		
CONDENSER FAN MOTOR	FLA (ea)	(2) @ 10.6 (3 HP)			(2) @ 4.8 (3 HP)		
POWER RETURN	(HP)	10	15	20	10	15	20
MOTOR	FLA	28.0	42.0	54.0	14.0	21.0	27.0
NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.							
AIR HANDLER ONLY (NO COMPRESSORS)							
	FLA	42.0	54.0	80.0	21.0	27.0	40.0
	MCA	52.5	67.5	100.0	26.3	33.8	50.0
	**MOP	94.5	121.5	180.0	47.3	60.8	90.0
AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)							
	FLA	44.2	56.2	82.2	22.1	28.1	41.1
	MCA	54.7	69.7	102.2	27.4	34.9	51.1
	**MOP	96.7	123.7	182.2	48.4	61.9	91.1
AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)							
ELEC. HEAT	FLA	142.4	154.4	180.4	71.2	77.2	90.2
	MCA	178.0	193.0	225.5	89.0	96.5	112.8
DESIGNATION "D"	**MOP	194.9	221.9	280.4	97.5	111.0	140.2
ELEC. HEAT	FLA	242.8	254.8	280.8	121.4	127.4	140.4
	MCA	253.3	268.3	300.8	126.7	134.2	150.4
DESIGNATION "F"	**MOP	295.3	322.3	380.8	147.7	161.2	190.4
ELEC. HEAT	FLA	343.2	355.2	381.2	171.6	177.6	190.6
	MCA	353.7	368.7	401.2	176.9	184.4	200.6
DESIGNATION "H"	**MOP	395.7	422.7	481.2	197.9	211.4	240.6
ELEC. HEAT	FLA	443.6	455.6	481.6	221.8	227.8	240.8
	MCA	454.1	469.1	501.6	227.1	234.6	250.8
DESIGNATION "J"	**MOP	496.1	523.1	581.6	248.1	261.6	290.8
ELEC. HEAT	FLA	544.0	556.0	582.0	272.0	278.0	291.0
	MCA	554.5	569.5	602.0	277.3	284.8	301.0
DESIGNATION "K"	**MOP	596.5	623.5	682.0	298.3	311.8	341.0
COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)							
	FLA	225.4	237.4	263.4	117	122.4	135.4
	MCA	237.7	250.9	283.4	124.5	128.5	145.4
	**MOP	286.7	304.9	363.4	146.8	156.2	185.4

IF A COOLING WITH ELECTRIC HEAT UNIT IS SELECTED, THEN THE AIR HANDLER WITH ELECTRIC HEAT FLA VALUE MUST BE COMPARED TO THE COOLING ONLY FLA VALUE. THE LARGEST FLA VALUE WILL BE THE BASIS FOR UNIT ELECTRICAL CALCULATIONS.

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RF-60		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN MOTOR	(HP)	15	20	30	15	20	30
	FLA	42.0	54.0	80.0	21.0	27.0	40.0
COMPRESSOR 1 & 2	FLA (ea)	49.0			24.3		
	LRA (ea)	420.0			175.0		
COMPRESSOR 3 & 4	FLA (ea)	49.0			24.3		
	LRA (ea)	420.0			175.0		
CONDENSER FAN MOTOR	FLA (ea)	(2) @ 10.6 (3 HP)			(2) @ 4.8 (3 HP)		
POWER RETURN MOTOR	(HP)	10	15	20	10	15	20
	FLA	28.0	42.0	54.0	14.0	21.0	27.0
NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.							
AIR HANDLER ONLY (NO COMPRESSORS)							
	FLA	42.0	54.0	80.0	21.0	27.0	40.0
	MCA	52.5	67.5	100.0	26.3	33.8	50.0
	**MOP	94.5	121.5	180.0	47.3	60.8	90.0
AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)							
	FLA	44.2	56.2	82.2	22.1	28.1	41.1
	MCA	54.7	69.7	102.2	27.4	34.9	51.1
	**MOP	96.7	123.7	182.2	48.4	61.9	91.1
AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)							
ELEC. HEAT	FLA	142.4	154.4	180.4	71.2	77.2	90.2
	MCA	178.0	193.0	225.5	89.0	96.5	112.8
DESIGNATION "D"	**MOP	194.9	221.9	280.4	97.5	111.0	140.2
ELEC. HEAT	FLA	242.8	254.8	280.8	121.4	127.4	140.4
	MCA	253.3	268.3	300.8	126.7	134.2	150.4
DESIGNATION "F"	**MOP	295.3	322.3	380.8	147.7	161.2	190.4
ELEC. HEAT	FLA	343.2	355.2	381.2	171.6	177.6	190.6
	MCA	353.7	368.7	401.2	176.9	184.4	200.6
DESIGNATION "H"	**MOP	395.7	422.7	481.2	197.9	211.4	240.6
ELEC. HEAT	FLA	443.6	455.6	481.6	221.8	227.8	240.8
	MCA	454.1	469.1	501.6	227.1	234.6	250.8
DESIGNATION "J"	**MOP	496.1	523.1	581.6	248.1	261.6	290.8
ELEC. HEAT	FLA	544.0	556.0	582.0	272.0	278.0	291.0
	MCA	554.5	569.5	602.0	277.3	284.8	301.0
DESIGNATION "K"	**MOP	596.5	623.5	682.0	298.3	311.8	341.0
COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)							
	FLA	259.2	271.2	297.2	127.8	133.8	146.8
	MCA	271.5	284.7	317.2	133.9	140.6	156.8
	**MOP	320.5	338.7	397.2	158.2	167.6	196.8

IF A COOLING WITH ELECTRIC HEAT UNIT IS SELECTED, THEN THE AIR HANDLER WITH ELECTRIC HEAT FLA VALUE MUST BE COMPARED TO THE COOLING ONLY FLA VALUE. THE LARGEST FLA VALUE WILL BE THE BASIS FOR UNIT ELECTRICAL CALCULATIONS.

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RF-70		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN MOTOR	(HP)	20	30	40	20	30	40
	FLA	54.0	80.0	104.0	27.0	40.0	52.0
COMPRESSOR 1 & 2	FLA (ea)	55.9			27.2		
	LRA (ea)	420.0			175.0		
COMPRESSOR 3 & 4	FLA (ea)	55.9			27.2		
	LRA (ea)	420.0			175.0		
CONDENSER FAN MOTOR	FLA (ea)	(3) @ 10.6 (3 HP)			(3) @ 4.8 (3 HP)		
POWER RETURN MOTOR	(HP)	15	20	30	15	20	30
	FLA	42.0	54.0	80.0	21.0	27.0	40.0

NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.

AIR HANDLER ONLY (NO COMPRESSORS)

	FLA	54.0	80.0	104.0	27.0	40.0	52.0
	MCA	67.5	100.0	130.0	33.8	50.0	65.0
	**MOP	121.5	180.0	234.0	60.8	90.0	117.0

AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)

	FLA	56.2	82.2	106.2	28.1	41.1	53.1
	MCA	69.7	102.2	132.2	34.9	51.1	66.1
	**MOP	123.7	182.2	236.2	61.9	91.1	118.1

AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)

ELEC. HEAT	FLA	154.4	180.4	204.4	77.2	90.2	102.2
	MCA	193.0	225.5	255.5	96.5	112.8	127.8
DESIGNATION "D"	**MOP	221.9	280.4	334.4	111.0	140.2	167.2
ELEC. HEAT	FLA	254.8	280.8	304.8	127.4	140.4	152.4
	MCA	268.3	300.8	330.8	134.2	150.4	165.4
DESIGNATION "F"	**MOP	322.3	380.8	434.8	161.2	190.4	217.4
ELEC. HEAT	FLA	355.2	381.2	405.2	177.6	190.6	202.6
	MCA	368.7	401.2	431.2	184.4	200.6	215.6
DESIGNATION "H"	**MOP	422.7	481.2	535.2	211.4	240.6	267.6
ELEC. HEAT	FLA	455.6	481.6	505.6	227.8	240.8	252.8
	MCA	469.1	501.6	531.6	234.6	250.8	265.8
DESIGNATION "J"	**MOP	523.1	581.6	635.6	261.6	290.8	317.8
ELEC. HEAT	FLA	556.0	582.0	606.0	278.0	291.0	303.0
	MCA	569.5	602.0	632.0	284.8	301.0	316.0
DESIGNATION "K"	**MOP	623.5	682.0	736.0	311.8	341.0	368.0

COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)

	FLA	309.4	335.4	359.4	150.2	163.2	175.2
	MCA	323.4	355.4	385.4	157.0	173.2	188.2
	**MOP	379.3	435.4	489.4	184.2	213.2	240.2

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RF-80		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN	(HP)	20	30	40	20	30	40
MOTOR	FLA	54.0	80.0	104.0	27.0	40.0	52.0
COMPRESSOR	FLA (ea)	49.0			24.3		
1 thru 3	LRA (ea)	420.0			175.0		
COMPRESSOR	FLA (ea)	32.1			18.6		
4 thru 6	LRA (ea)	260.0			130.0		
CONDENSER FAN MOTOR	FLA (ea)	(3) @ 10.6 (3 HP)			(3) @ 4.8 (3 HP)		
POWER RETURN	(HP)	15	20	30	15	20	30
MOTOR	FLA	42.0	54.0	80.0	21.0	27.0	40.0
NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.							
AIR HANDLER ONLY (NO COMPRESSORS)							
	FLA	54.0	80.0	104.0	27.0	40.0	52.0
	MCA	67.5	100.0	130.0	33.8	50.0	65.0
	**MOP	121.5	180.0	234.0	60.8	90.0	117.0
AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)							
	FLA	56.2	82.2	106.2	28.1	41.1	53.1
	MCA	69.7	102.2	132.2	34.9	51.1	66.1
	**MOP	123.7	182.2	236.2	61.9	91.1	118.1
AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)							
ELEC. HEAT	FLA	154.4	180.4	204.4	77.2	90.2	102.2
	MCA	193.0	225.5	255.5	96.5	112.8	127.8
DESIGNATION "D"	**MOP	221.9	280.4	334.4	111.0	140.2	167.2
ELEC. HEAT	FLA	254.8	280.8	304.8	127.4	140.4	152.4
	MCA	268.3	300.8	330.8	134.2	150.4	165.4
DESIGNATION "F"	**MOP	322.3	380.8	434.8	161.2	190.4	217.4
ELEC. HEAT	FLA	355.2	381.2	405.2	177.6	190.6	202.6
	MCA	368.7	401.2	431.2	184.4	200.6	215.6
DESIGNATION "H"	**MOP	422.7	481.2	535.2	211.4	240.6	267.6
ELEC. HEAT	FLA	455.6	481.6	505.6	227.8	240.8	252.8
	MCA	469.1	501.6	531.6	234.6	250.8	265.8
DESIGNATION "J"	**MOP	523.1	581.6	635.6	261.6	290.8	317.8
ELEC. HEAT	FLA	556.0	582.0	606.0	278.0	291.0	303.0
	MCA	569.5	602.0	632.0	284.8	301.0	316.0
DESIGNATION "K"	**MOP	623.5	682.0	736.0	311.8	341.0	368.0
COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)							
	FLA	329.1	355.1	379.1	170.1	183.1	195.1
	MCA	342.6	375.1	405.1	176.9	193.1	208.1
	**MOP	396.6	455.1	509.1	203.9	233.1	260.1

IF A COOLING WITH ELECTRIC HEAT UNIT IS SELECTED, THEN THE AIR HANDLER WITH ELECTRIC HEAT FLA VALUE MUST BE COMPARED TO THE COOLING ONLY FLA VALUE. THE LARGEST FLA VALUE WILL BE THE BASIS FOR UNIT ELECTRICAL CALCULATIONS.

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RF-90		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN	(HP)	30	40	50	30	40	50
MOTOR	FLA	80.0	104.0	130.0	40.0	52.0	65.0
COMPRESSOR	FLA (ea)	55.9			27.2		
1 thru 3	LRA (ea)	420.0			175.0		
COMPRESSOR	FLA (ea)	49.0			24.3		
4 thru 6	LRA (ea)	420.0			175.0		
CONDENSER FAN MOTOR	FLA (ea)	(4) @ 10.6 (3 HP)			(4) @ 10.6 (3 HP)		
POWER RETURN	(HP)	20	30	40	20	30	40
MOTOR	FLA	54.0	80.0	104.0	27.0	40.0	52.0

NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.

AIR HANDLER ONLY (NO COMPRESSORS)

	FLA	80.0	104.0	130.0	40.0	52.0	65.0
	MCA	100.0	130.0	162.5	50.0	65.0	81.3
	**MOP	180.0	234.0	292.5	90.0	117.0	146.3

AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)

	FLA	82.2	106.2	132.2	41.1	53.1	66.1
	MCA	102.2	132.2	164.7	51.1	66.1	82.4
	**MOP	182.2	236.2	294.7	91.1	118.1	147.4

AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)

ELEC. HEAT	FLA	180.4	204.4	230.4	90.2	102.2	115.2
	MCA	225.5	255.5	288.0	112.8	127.8	144.0
DESIGNATION "D"	**MOP	280.4	334.4	392.9	140.2	167.2	196.5
ELEC. HEAT	FLA	280.8	304.8	330.8	140.4	152.4	165.4
	MCA	300.8	330.8	363.3	150.4	165.4	181.7
DESIGNATION "F"	**MOP	380.8	434.8	493.3	190.4	217.4	246.7
ELEC. HEAT	FLA	381.2	405.2	431.2	190.6	202.6	215.6
	MCA	401.2	431.2	463.7	200.6	215.6	231.9
DESIGNATION "H"	**MOP	481.2	535.2	593.7	240.6	267.6	296.9
ELEC. HEAT	FLA	481.6	505.6	531.6	240.8	252.8	265.8
	MCA	501.6	531.6	564.1	250.8	265.8	282.1
DESIGNATION "J"	**MOP	581.6	635.6	694.1	290.8	317.8	347.1
ELEC. HEAT	FLA	582.0	606.0	632.0	291.0	303.0	316.0
	MCA	602.0	632.0	664.5	301.0	316.0	332.3
DESIGNATION "K"	**MOP	682.0	736.0	794.5	341.0	368.0	397.3

COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)

	FLA	437.1	461.1	487.1	213.7	225.7	238.7
	MCA	457.1	487.1	519.6	223.7	238.7	255.0
	**MOP	537.1	591.1	649.6	263.7	290.7	320.0

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RF-110		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN	(HP)	40	50	60	40	50	60
MOTOR	FLA	104.0	130.0	154.0	52.0	65.0	77.0
COMPRESSOR	FLA (ea)	49.0			24.3		
1 thru 4	LRA (ea)	42.0			175.0		
COMPRESSOR	FLA (ea)	32.1			18.6		
5 thru 8	LRA (ea)	260.0			130.0		
CONDENSER FAN MOTOR	FLA (ea)	(4) @ 10.6 (3 HP)			(4) @ 4.8 (3 HP)		
POWER RETURN	(HP)	20	30	40	20	30	40
MOTOR	FLA	54.0	80.0	104.0	27.0	40.0	52.0
NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.							
AIR HANDLER ONLY (NO COMPRESSORS)							
	FLA	80.0	104.0	130.0	40.0	52.0	65.0
	MCA	100.0	130.0	162.5	50.0	65.0	81.3
	**MOP	180.0	234.0	292.5	90.0	117.0	146.3
AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)							
	FLA	82.2	106.2	132.2	41.1	53.1	66.1
	MCA	102.2	132.2	164.7	51.1	66.1	82.4
	**MOP	182.2	236.2	294.7	91.1	118.1	147.4
AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)							
ELEC. HEAT	FLA	204.4	230.4	254.4	102.2	115.2	127.2
	MCA	255.5	288.0	318.0	127.8	144.0	159.0
DESIGNATION "D"	**MOP	334.4	392.9	446.9	167.2	196.5	223.5
ELEC. HEAT	FLA	304.8	330.8	354.8	152.4	165.4	177.4
	MCA	330.8	363.3	393.3	165.4	181.7	196.7
DESIGNATION "F"	**MOP	434.8	493.3	547.3	217.4	246.7	273.7
ELEC. HEAT	FLA	405.2	431.2	455.2	202.6	215.6	227.6
	MCA	431.2	463.7	493.7	215.6	231.9	246.9
DESIGNATION "H"	**MOP	535.2	593.7	647.7	267.6	296.9	323.9
ELEC. HEAT	FLA	505.6	531.6	555.6	252.8	265.8	277.8
	MCA	531.6	564.1	594.1	265.8	282.1	297.1
DESIGNATION "J"	**MOP	635.6	694.1	748.1	317.8	347.1	374.1
ELEC. HEAT	FLA	606.0	632.0	656.0	303.0	316.0	328.0
	MCA	632.0	664.5	694.5	316.0	332.3	347.3
DESIGNATION "K"	**MOP	736.0	794.5	848.5	368.0	397.3	424.3
COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)							
	FLA	470.8	496.8	520.8	242.8	255.8	267.8
	MCA	496.8	529.3	559.3	255.8	272.1	287.1
	**MOP	600.8	659.3	713.3	307.8	337.1	364.1

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RF-120		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN	(HP)	40	50	60	40	50	60
MOTOR	FLA	104.0	130.0	154.0	52.0	65.0	77.0
COMPRESSOR	FLA (ea)	49.0			24.3		
1 thru 4	LRA (ea)	420.0			175.0		
COMPRESSOR	FLA (ea)	49.0			24.3		
5 thru 8	LRA (ea)	420.0			175.0		
CONDENSER FAN MOTOR	FLA (ea)	(4) @ 10.6 (3 HP)			(4) @ 4.8 (3 HP)		
POWER RETURN	(HP)	20	30	40	20	30	40
MOTOR	FLA	54.0	80.0	104.0	27.0	40.0	52.0
NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.							
AIR HANDLER ONLY (NO COMPRESSORS)							
	FLA	80.0	104.0	130.0	40.0	52.0	65.0
	MCA	100.0	130.0	162.5	50.0	65.0	81.3
	**MOP	180.0	234.0	292.5	90.0	117.0	146.3
AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)							
	FLA	82.2	106.2	132.2	41.1	53.1	66.1
	MCA	102.2	132.2	164.7	51.1	66.1	82.4
	**MOP	182.2	236.2	294.7	91.1	118.1	147.4
AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)							
ELEC. HEAT	FLA	204.4	230.4	254.4	102.2	115.2	127.2
	MCA	255.5	288.0	318.0	127.8	144.0	159.0
DESIGNATION "D"	**MOP	334.4	392.9	446.9	167.2	196.5	223.5
ELEC. HEAT	FLA	304.8	330.8	354.8	152.4	165.4	177.4
	MCA	330.8	363.3	393.3	165.4	181.7	196.7
DESIGNATION "F"	**MOP	434.8	493.3	547.3	217.4	246.7	273.7
ELEC. HEAT	FLA	405.2	431.2	455.2	202.6	215.6	227.6
	MCA	431.2	463.7	493.7	215.6	231.9	246.9
DESIGNATION "H"	**MOP	535.2	593.7	647.7	267.6	296.9	323.9
ELEC. HEAT	FLA	505.6	531.6	555.6	252.8	265.8	277.8
	MCA	531.6	564.1	594.1	265.8	282.1	297.1
DESIGNATION "J"	**MOP	635.6	694.1	748.1	317.8	347.1	374.1
ELEC. HEAT	FLA	606.0	632.0	656.0	303.0	316.0	328.0
	MCA	632.0	664.5	694.5	316.0	332.3	347.3
DESIGNATION "K"	**MOP	736.0	794.5	848.5	368.0	397.3	424.3
COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)							
	FLA	538.4	564.4	588.4	265.6	278.6	290.6
	MCA	564.4	596.9	626.9	278.6	294.9	309.9
	**MOP	668.4	726.9	780.9	330.6	359.9	386.9

IF A COOLING WITH ELECTRIC HEAT UNIT IS SELECTED, THEN THE AIR HANDLER WITH ELECTRIC HEAT FLA VALUE MUST BE COMPARED TO THE COOLING ONLY FLA VALUE. THE LARGEST FLA VALUE WILL BE THE BASIS FOR UNIT ELECTRICAL CALCULATIONS.

**** NOTE: MOP VALUES LISTED ON THIS PAGE HAVE NOT BEEN ROUNDED TO THE STANDARD VALUES. CONSULT THE CALCULATION PAGE TO DETERMINE THE ACTUAL VALUES.**

RF-130		230 / 3 / 60			460 / 3 / 60		
		STD.	OS	DBL OS	STD.	OS	DBL OS
SUPPLY FAN	(HP)	50	60	75	50	60	75
MOTOR	FLA	130.0	154.0	192.0	65.0	77.0	96.0
COMPRESSOR	FLA (ea)	55.9			27.2		
1 thru 4	LRA (ea)	420.0			175.0		
COMPRESSOR	FLA (ea)	55.9			27.2		
5 thru 8	LRA (ea)	420.0			175.0		
CONDENSER FAN MOTOR	FLA (ea)	(4) @ 10.6 (3 HP)			(4) @ 4.8 (3 HP)		
POWER RETURN	(HP)	30	40	50	30	40	50
MOTOR	FLA	80.0	104.0	130.0	40.0	52.0	65.0
NOTICE THAT THE FOLLOWING VALUES DO NOT INCLUDE POWER RETURN.							
AIR HANDLER ONLY (NO COMPRESSORS)							
	FLA	130.0	154.0	192.0	65.0	77.0	96.0
	MCA	162.5	192.5	240.0	81.3	96.3	120.0
	**MOP	292.5	346.5	432.0	146.3	173.3	216.0
AIR HANDLER WITH GAS HEAT (NO COMPRESSORS)							
	FLA	132.2	156.2	194.2	66.1	78.1	97.1
	MCA	164.7	194.7	242.2	82.4	97.4	121.1
	**MOP	294.7	348.7	434.2	147.4	174.4	217.1
AIR HANDLER WITH ELECTRIC HEAT (NO COMPRESSORS)							
ELEC. HEAT	FLA	230.4	254.4	292.4	115.2	127.2	146.2
	MCA	288.0	318.0	365.5	144.0	159.0	182.8
DESIGNATION "D"	**MOP	392.9	446.9	532.4	196.5	223.5	266.2
ELEC. HEAT	FLA	330.8	354.8	392.8	165.4	177.4	196.4
	MCA	363.3	393.3	440.8	181.7	196.7	220.4
DESIGNATION "F"	**MOP	493.3	547.3	632.8	246.7	273.7	316.4
ELEC. HEAT	FLA	431.2	455.2	493.2	215.6	227.6	246.6
	MCA	463.7	493.7	541.2	231.9	246.9	270.6
DESIGNATION "H"	**MOP	593.7	647.7	733.2	296.9	323.9	366.6
ELEC. HEAT	FLA	531.6	555.6	593.6	265.8	277.8	296.8
	MCA	564.1	594.1	641.6	282.1	297.1	320.8
DESIGNATION "J"	**MOP	694.1	748.1	833.6	347.1	374.1	416.8
ELEC. HEAT	FLA	632.0	656.0	694.0	316.0	328.0	347.0
	MCA	664.5	694.5	742.0	332.3	347.3	371.0
DESIGNATION "K"	**MOP	794.5	848.5	934.0	397.3	424.3	467.0
COOLING ONLY OR COOLING WITH GAS HEAT (WITH COMPRESSORS)							
	FLA	619.6	643.6	681.6	301.8	313.8	332.8
	MCA	652.1	682.1	729.6	318.1	333.1	356.8
	**MOP	782.1	836.1	921.6	383.1	410.1	452.8

IF A COOLING WITH ELECTRIC HEAT UNIT IS SELECTED, THEN THE AIR HANDLER WITH ELECTRIC HEAT FLA VALUE MUST BE COMPARED TO THE COOLING ONLY FLA VALUE. THE LARGEST FLA VALUE WILL BE THE BASIS FOR UNIT ELECTRICAL CALCULATIONS.

**** NOTE: MOP VALUES LISTED ON THIS PAGE HAVE NOT BEEN ROUNDED TO THE STANDARD VALUES. CONSULT THE CALCULATION PAGE TO DETERMINE THE ACTUAL VALUES.**

AVAILABLE OPTIONS		230 / 3 / 60		460 / 3 / 60	
		STD.	OS	STD.	OS
PROP. EXH.	(HP)	(1) or (2) @ 3 HP	N/A	(1) or (2) @ 3 HP	N/A
MOTOR	FLA	10.6	N/A	4.8	N/A
PLENUM EXH.	(HP)	(2) @ 5 HP	(2) @ 10 HP	(2) @ 5 HP	(2) @ 10 HP
MOTOR	FLA	15.2	28	7.6	14
HEAT WHEEL	(HP)	(1) or (2) @ 5 HP	(1) or (2) @ 10 HP	(1) or (2) @ 5 HP	(1) or (2) @ 10 HP
EXH. MOTOR	FLA	15.2	28	7.6	14
HEAT WHEEL	(HP)	0.25	N/A	0.25	N/A
MOTOR	FLA	2.9	N/A	1.5	N/A

heat content of air - enthalpy

BTU CONTENT OF 1 LB. OF DRY AIR WITH WATER VAPOR TO SATURATE IT

TABLE 67-1 (Standard Atmospheric Pressure 29.921" W.G.)

WET BULB °F	TENTHS OF DEGREES									
	.0	.1	.2	.3	.4	.5	.6	.7	.8	.9
50	20.30	20.36	20.41	20.47	20.52	20.58	20.64	20.69	20.75	20.81
51	20.86	20.92	20.98	21.03	21.09	21.15	21.21	21.26	21.32	21.38
52	21.44	21.49	21.55	21.61	21.67	21.73	21.79	21.84	21.90	21.96
53	22.02	22.08	22.14	22.20	22.26	22.32	22.38	22.44	22.50	22.56
54	22.61	22.68	22.74	22.80	22.86	22.92	22.98	23.04	23.10	23.16
55	23.22	23.28	23.34	23.41	23.47	23.53	23.59	23.65	23.72	23.78
56	23.84	23.90	23.97	24.03	24.10	24.16	24.22	24.29	24.35	24.42
57	24.48	24.54	24.61	24.67	24.74	24.80	24.86	24.93	24.99	25.06
58	25.12	25.19	25.25	25.32	25.38	25.45	25.52	25.58	25.65	25.71
59	25.78	25.85	25.92	25.98	26.05	26.12	26.19	26.26	26.32	26.39
60	26.46	26.53	26.60	26.67	26.74	26.80	26.87	26.94	27.01	27.08
61	27.15	27.22	27.29	27.36	27.43	27.50	27.57	27.64	27.71	27.78
62	27.85	27.92	27.99	28.07	28.14	28.21	28.28	28.35	28.43	28.50
63	28.57	28.64	28.72	28.79	28.87	28.94	29.01	29.09	29.16	29.24
64	29.31	29.38	29.46	29.53	29.61	29.68	29.76	29.83	29.91	29.98
65	30.06	30.14	30.21	30.29	30.37	30.44	30.52	30.60	30.68	30.75
66	30.83	30.91	30.99	31.07	31.15	31.22	31.30	31.38	31.46	31.54
67	31.62	31.70	31.78	31.86	31.94	32.02	32.10	32.18	32.26	32.34
68	32.42	32.50	32.59	32.67	32.75	32.83	32.92	33.00	33.08	33.17
69	33.25	33.33	33.42	33.50	33.59	33.67	33.75	33.84	33.92	34.00
70	34.09	34.18	34.26	34.35	34.43	34.52	34.61	34.69	34.79	34.86
71	34.95	35.13	35.13	35.21	35.30	35.39	35.48	35.57	35.65	35.74
72	35.83	35.92	36.01	36.10	36.19	36.28	36.38	36.47	36.56	36.65
73	36.74	36.83	36.92	37.02	37.11	37.20	37.29	37.38	37.48	37.57
74	37.66	37.75	37.85	37.94	38.04	38.13	38.23	38.32	38.42	38.51
75	38.61	38.71	38.80	38.90	39.00	39.09	39.19	39.28	39.38	39.47
76	39.57	39.67	39.77	39.87	39.98	40.07	40.17	40.27	40.37	40.47
77	40.57	40.67	40.77	40.87	40.97	41.07	41.18	41.28	41.38	41.48
78	41.58	41.68	41.79	41.89	42.00	42.10	42.20	42.31	42.41	42.52
79	42.62	42.73	42.83	42.94	43.05	43.15	43.26	43.37	43.48	43.58

mechanical cooling formulas

Cooling Capacities are Gross Capacities and do not account for indoor fan motor heat.
Determine Net Capacity using the following formula:

Net Total Capacity = Gross Capacity - In Door (ID) Fan Motor Heat = Gross Capacity - (KW x 3.414)

For Net Sensible Capacitiy, deduct same ID Fan Motor Heat from Gross Sensible.

$$TLDB = TEDB - \frac{\text{NET SENSIBLE CAPACITY (BTUH)}}{1.085 \times CFM}$$

$$HLWB = HEWB - \frac{\text{NET TOTAL CAPACITY (BTUH)}}{4.5 \times CFM}$$

WHERE: TLDB and TEDB = Dry Bulb Temperature Leaving and Entering Evaporator Coil.

HLWB and HEWB = Enthalpy of air corresponding to Wet Bulb Temperature Leaving and Entering Evap. Coil.

To calculate heat gain from fan:

(1) For motor NOT in the air stream (supply fan).
KW = BHP x 0.746. BHP read from blower curve.

(2) For motor IN the air stream (return fan).

$$KW = \frac{BHP \times 0.746}{EFF.}$$ EFF. from table.

FAN LAWS

$$HP = \frac{CFM \times \text{Static Pressure, Ins. } H_2O}{6350 \times \text{Efficiency}}$$

CFM = varies directly as the speed ratio.

$$CFM_2 = CFM_1 \left(\frac{RPM_2}{RPM_1} \right)$$

Static Pressure varies as the sq. of the speed ratio.

$$SP_2 = SP_1 \left(\frac{RPM_2}{RPM_1} \right)^2$$

H.P. varies as the cube of the speed ratio.

$$HP_2 = HP_1 \left(\frac{RPM_2}{RPM_1} \right)^3$$

SUPPLY AND RETURN FANS • 1725 RPM INDOOR BLOWER MOTOR DATA			
NOM. MTR HP	% STANDARD EFF.	% HIGH EFF.	SERVICE FACTOR
5	85	90	1.15
7.5	85	91	
10	85	92	
15	87	92	
20	88	93	
25	88	92	
30	89	92	
40	90	94	
50	92	94	
60	92	94	
75	92	95	
PROPELLER EXHAUST FANS • 1140 RPM			
3	82	90	1.15

THE TRADITIONAL DESIGN

The amount and type of isolation of any rooftop unit may vary greatly based on the manufacturer's treatment of three internal components: compressor(s); supply fan; condenser fan(s).

A common and traditional rooftop unit design uses a semi-hermetic compressor that requires springs for isolation due to its weight and the amplitude of the reciprocating components, as well as, the horizontal position and operation of the compressor crankshaft. The supply motor and fan assembly may also be isolated through a number of schemes that use springs or rubber in shear arrangements. The condenser fan and motor assemblies are never isolated from the base unit. In these cases, three or more methods are used for vibration isolation. The overall unit performance can vary greatly when the unit is resting directly on the roof curb.

THE AAON SOLUTION

The AAON Type RF is unique in many ways with its component selection and mounting that has been designed with minimum vibration as the basis of design. Smaller, multiple scroll compressors are used that have a vertical crankshaft. The motor speed is also twice that of the semi-hermetic and can be more easily isolated by rubber in shear mounting grommets on each compressor.

The compressors are in turn mounted on a specially designed steel platform that provides additional isolation and attenuation. The supply fan is an airfoil plenum fan, fabricated of light weight aluminum. It is statically and dynamically balanced in the application. The condenser fan and motor assembly is directly mounted in the normal manner.

The AAON design provides for a 2 inch rubber gasket to be placed on the curb prior to setting the RF unit. This acts as a final block to any possible objectionable vibrations being transferred to the building frame.

Local codes in many areas of the country are now requiring a "seismic curb" that contains isolating springs to deliver additional equipment protection. Many engineers are also designing with isolation curbs in order to minimize vibration and sound transmission into the building structure. These curbs are best applied to AAON equipment that do not contain component isolation springs that can actually counter the operation of these isolation curbs. The traditional design with internal isolation springs used in competitive equipment may require rework or even replacement of the internal isolation springs in order that the seismic curb will perform correctly.

'RF' ROOFTOP HVAC UNIT SPECIFICATIONS

Rooftop units shall be in accordance with the following specifications and capacities as shown on the plans.

UNIT PERFORMANCE

- Unit minimum cooling efficiency including all items except the supply air blower motor shall be greater than 9.7 EER.
- Unit shall have a minimum heating system efficiency of 80%.
- Units shall be safety certified in accordance with UL Standard UL1995 and ANSI Standard Z21.47.
- Unit shall be safety certified by an accredited testing laboratory.
- Unit nameplate shall carry the label of the certification agency.
- Unit shall be 100% run tested by the manufacturer with a copy of the run test report shipped with the unit.

UNIT CONSTRUCTION

- Unit shall be completely factory assembled, piped and wired and shipped in one piece.
- Unit shall be specifically designed for outdoor rooftop application with a fully weatherproof cabinet.
- Cabinet shall be constructed entirely of G90 wt. galvanized metal with the exterior constructed of 18 gauge or heavier material.
- Paint finish shall be capable of withstanding at least 2000 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.
- The unit roof shall be sloped to assure drainage.
- A walk-in compartment shall contain the compressors, supply blower motor and electrical control panel.
- Unit specific color coded wiring diagrams will match the unit color coded wiring and will be provided in both point-to-point and ladder form.
- Diagrams shall also be laminated in plastic and permanently affixed inside the control compartment.
- Access to filters, blower, heating section, and other items needing periodic checking or maintenance shall be through hinged access doors with latches which are operable from both sides. (Door fastening screws are not acceptable).
- Air side service access doors shall be fully gasketed with rain break overhangs.
- All access doors will have an internal metal liner to protect the doors insulation.
- The interior air side of the cabinet shall be entirely insulated on all exterior panels with fiberglass insulation covered with a metal liner.
- Unit shall have decals and tags to indicate unit lifting - rigging, service areas and caution areas. Installation and maintenance manuals shall be supplied with each unit.

OPTIONS: (select one)

1. Unit exterior to be "Grey" in color.
2. Unit exterior to be "Tan" in color.

SUPPLY FAN

- The fan wheel shall be an aluminum, single width / single inlet airfoil type and secured to a tubular shaft with swagged journals.
- Bearings shall be self-adjusting pillow block type and shall be designed for at least 200,000 hours average life.
- Fixed pitch V-belt drive shall be provided with a minimum rating of 150% of the motor nameplate break horsepower. Manufacturer will provide an additional sheave if required to air balance the system.
- Supply fan, drives and motors shall be dynamically balanced.

OUTSIDE AIR: (Select One)

1) Shall be 0-50% with an adjustable, motor operated outside air damper constructed of extruded aluminum, hollow core, air foil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 25 CFM of leakage per sq. ft. of damper area when subjected to 2" WG air pressure differential across the damper. Damper motor shall be spring return to ensure closing of outdoor air damper during periods of unit shut down or power failure.
2) Shall be 0 - 100% with a motor operated outside air damper constructed of extruded aluminum, hollow core, air foil blade with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 25 CFM of leakage per sq. ft. of damper area when subjected to 2" WG air pressure differential across the damper. Damper motor shall be spring return to ensure closing of outdoor air damper during periods of unit shut down or power failure.
3) Shall be 3-position dry bulb activated economizer with multistage integrated economizer and compressor operation controlled by the conditioned space controller for maximum benefit. The economizer shall consist of a motor operated outdoor air damper and return air damper constructed of extruded aluminum, hollow core, air foil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 25 CFM of leakage per sq. ft. of damper area when subjected to 2" WG air pressure differential across the damper. Damper motor shall be spring return to ensure closing of outdoor air damper during periods of unit shut down or power failure.
4) Shall be 3-position, enthalpy activated economizer with multistage integrated economizer and compressor operation controlled by the conditioned space controller for maximum benefit. The economizer shall consist of a motor operated outdoor air damper and return air damper constructed of extruded aluminum, hollow core, air foil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 25 CFM of leakage per sq. ft. of damper area when subjected to 2" WG air pressure differential across the damper. Damper motor shall be spring return to ensure closing of outdoor air damper during periods of unit shut down or power failure.
5) Shall be a fully modulating, enthalpy controlled economizer with multistage integrated economizer and compressor operation for maximum benefit. The economizer shall consist of a motor operated outdoor air damper and return air damper constructed of extruded aluminum, hollow core, air foil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 25 CFM of leakage per sq. ft. of damper area when subjected to 2" WG air pressure differential across the damper. Damper motor shall be spring return to ensure closing of outdoor air damper during periods of unit shut down or power failure.

POWER RETURN / EXHAUST FAN (Optional)

- The fan wheel shall be an aluminum, single width / single inlet airfoil type, secured to a tubular shaft with swagged journals.
- Bearings shall be self-adjusting pillow block type and shall be designed for at least 200,000 hours average life.
- Exhaust air relief dampers, sized for 100% relief, shall be provided as part of the power return / exhaust option.

POWER EXHAUST (Optional)

- Propeller exhaust fan shall be direct drive.
- Plenum exhaust fan shall be an adjustable belt drive.

NON-POWERED RETURN / EXHAUST SECTION (Optional)

- A non-powered return / exhaust section shall be supplied for return duct connection. This section shall be designed to handle the full airflow requirements of the economizer operation.
- Exhaust air relief damper, sized for 100% relief, shall be provided as part of the non-powered return / exhaust section.

HEATWHEEL

- Factory mounted and tested.
- 4" outside air filters.
- SISW (single inlet single width) plenum exhaust fan.
- Total energy wheel.
- Cleanable.
- Segmented for easy service.

OPTIONS:

- Frost protection.
- Economizer cycle.
- Variable speed control.
- Rotation detector.

CONDENSING SECTION

- The condenser coils, facing out, shall be protected by a sheet of perforated metal.
- The condensing section shall be equipped with direct drive, vertical discharge condenser fans.
- The condenser coils shall be sloped to protect the coils from damage.
- Condenser coils shall be copper tube with aluminum fins mechanically bonded to the tubes.
- Condenser coils to be sized for a minimum of 10 degrees sub-cooling.

OPTIONS:

1) Condenser coils shall be copper tube aluminum fins mechanically bonded to the tubes and with a baked-on phenolic corrosion resistant coating.

EVAPORATOR COIL

- Evaporator coils shall be copper tube with aluminum fins mechanically bonded to the tubes.
- Evaporator coils to have galvanized steel end casings.
- Evaporator coils to have equalizing type vertical tube distributors.
- Evaporator coils for multi-compressor units shall be circuited with one circuit and expansion valve per compressor.

REFRIGERATION SYSTEM

- Compressors shall be Scroll type with internal thermal overload protection and mounted on the compressor manufacturer's recommended rubber vibration isolators.
- All units shall be multiple stage with a minimum of 2 stages of capacity control.
- Compressors shall be mounted in an isolated walk-in compartment to permit operation of the unit without affecting air flow when the door is open.
- Compressors shall be isolated from the base pan and supply air to avoid any transmission of noise from the compressor into the building area.
- System shall be equipped with thermostatic expansion valve(s) type refrigerant flow control.
- System shall be equipped with automatic reset low pressure and manual reset high pressure refrigerant controls.
- Unit shall be equipped with Schrader type service fittings on both the high side and low pressure sides of the system.
- Unit shall be equipped with refrigerant liquid line driers.
- Unit shall be fully factory charged with refrigerant R-22.

OPTIONS: (Multiple selections are permissible)

1) Lead and lag circuits shall be provided with hot gas bypass.
2) Both circuits shall be provided with hot gas bypass.
3) All circuits shall be equipped with liquid line sight glasses.
4) Unit shall be provided with a hot gas reheat coil piped to the lead refrigerant system.
5) Unit shall be provided with a hot gas reclaim coil for field piping to another units refrigerant system.
6) Unit shall be equipped with a 5 minute anti-short cycle delay timer for each stage.
7) Unit shall be equipped with 20 second between stage delay timer for each stage.

AIR HANDLING UNIT ONLY (Select One)

1) Units shall be furnished with a DX coil complete with thermostatic expansion valve but with no other cooling side components. See "Evaporator Coil" specifications for coil selection options.
2) Units shall be furnished with a 4 row chilled water coil, copper tube with aluminum fins mechanically bonded to the tubes.
3) Units shall be furnished with a 4 row chilled water coil, copper tube with aluminum fins mechanically bonded to the tubes and with a baked-on phenolic corrosion resistant coating.
4) Units shall be furnished with a 6 row chilled water coil, copper tube with aluminum fins mechanically bonded to the tubes.
5) Units shall be furnished with a 6 row chilled water coil, copper tube with aluminum fins mechanically bonded to the tubes and with a baked-on phenolic corrosion resistant coating.

GAS HEATING SECTION

- Unit shall heat using natural gas fuel and with a minimum two stages of heat capacity.
- Unit shall be provided with a gas heating furnace consisting of an stainless steel tubular heat exchanger, an induced draft blower and a differential pressure switch to lockout the gas valve until the combustion chamber is purged and combustion air flow is established.
- Unit shall be provided with a gas ignition system consisting of an electronic ignition system which will de-energize upon flame detector.
- Unit shall have gas supply piping entrances in the unit base for through the curb gas piping.
- Units tubular gas heat exchanger will have a 10 year warranty.

ELECTRIC HEAT

- Unit shall be provided with an electric heating section complete with fuses, a resetable high temperature limit switch and heating capacities as shown on the plans.

HOT WATER COIL

- Unit shall be provided with a 2 row hot water heating coil, with copper tube and aluminum fins mechanically bonded to the tubes.

OPTIONS:

1) Unit shall be provided with a 2 row hot water heating coil, with copper tube and aluminum fins mechanically bonded to the tubes and with a baked-on phenolic corrosion resistant coating.

STEAM COIL

- Unit shall be provided with a 2 row tube-in-tube "standard" steam coil, 5/8" copper tube with aluminum fins mechanically bonded to the tubes.

OPTIONS:

Unit shall be provided with a 2 row tube-in-tube "standard" steam coil, 5/8" copper tube with aluminum fins mechanically bonded to the tubes and with a baked-on phenolic corrosion resistant coating.

FILTERS

OPTIONS: (Multiple selections are permissible)

1) Unit to be furnished with 2" permanent frame filter with replaceable media.
2) Unit to be furnished with 2" , 30% efficient, pleated, throw away supply air filters.
3) Unit to be furnished with 4" , 30% efficient, pleated, throw away supply air filters and clogged filter switch.
4) Unit to be furnished with 4" pre-filters with 12", 85% efficient final filter.
5) Unit to be provided with a clogged filter switch.
6) Unit to be provided with a direct dial reading Magnehelic gauge mounted in the control compartment.

VAV UNIT CONTROL

- Control of supply air flow modulation shall be by factory installed VFD blower speed controller, controlled by a factory installed system pressure controller and a field installed duct static pressure sensing device.
- Control of supply air flow modulation shall be by factory installed inlet vanes, controlled by a factory installed system pressure controller and a field installed duct static pressure sensing device.
- Unit shall be equipped with a discharge air temperature controller. Controller shall be multistage. Controller to include compressor anti-short cycle protection for each compressor.

OPTIONS: (Multiple selections are permissible)

1) Unit shall be equipped with hot gas by-pass control on lead refrigeration stage to protect against evaporator frosting at low air flows and suction pressures.
2) Unit shall be equipped with morning warm up thermostat controller.
3) Unit shall be equipped with morning warm up thermostat controller and a night set back temperature controller with a cooling lock-out function.

SMOKE DETECTOR: (Select one each)

1) Unit shall be provided with a smoke detector(s) sensing in the: (A) return air; (B) supply air; or (C) both the return & supply air portion of the unit wired to: (a) shut off the supply fan; or (b) shut off the unit control circuit.

POWER OPTION: (Multiple selections are permissible)

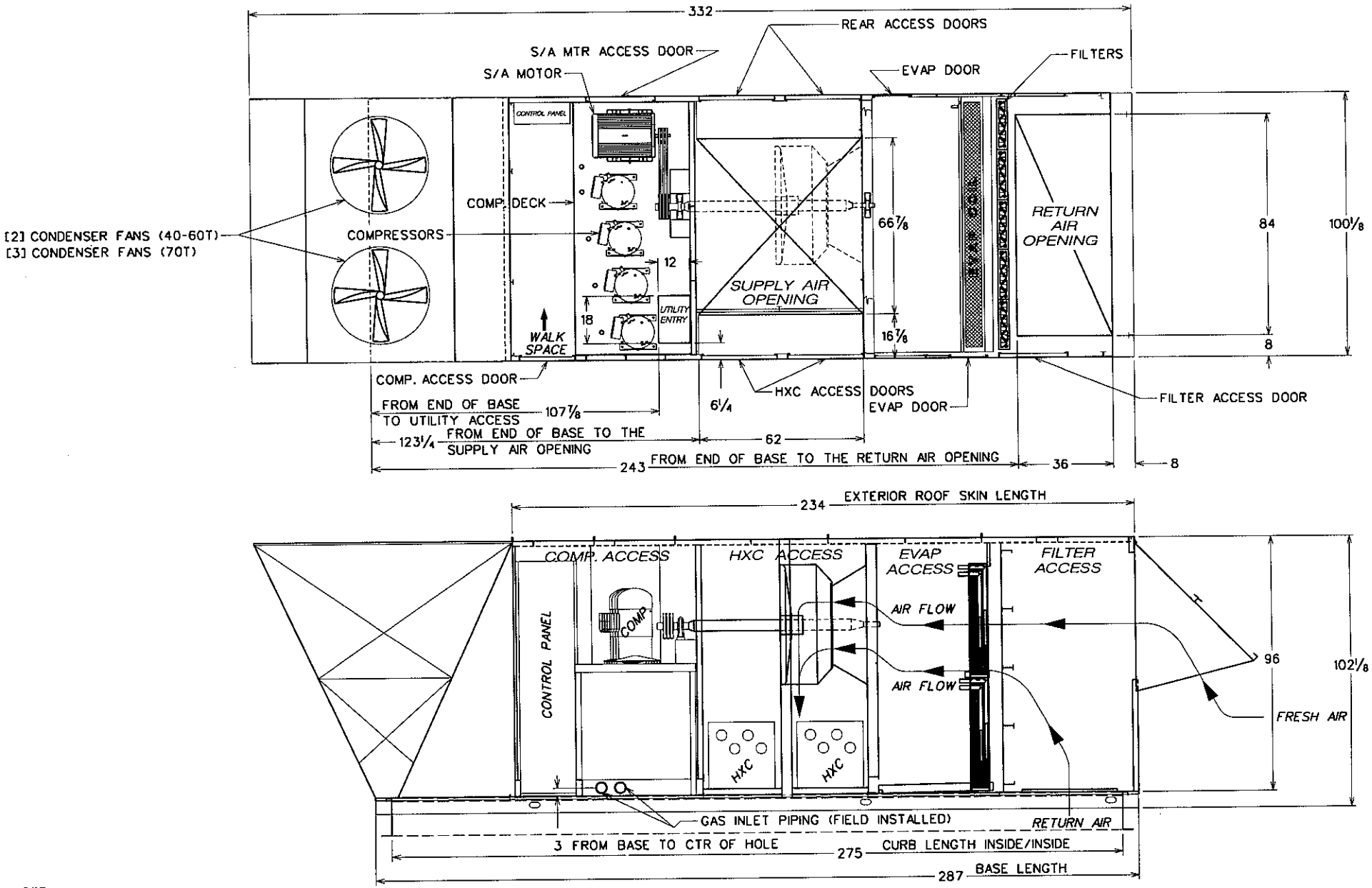
1) Unit shall be provided with a factory installed and wired internal disconnect.
2) Unit shall be provided with phase and brown-out protection to shut down all motors in the unit if the phases are more than 10% out of balance on voltage, or the voltage is more than 10% under design voltage or on phase reversal.
3) Unit shall be provided with a factory installed and wired 115 volt, 13 amp ground fault service receptacle.
4) Unit shall be provided with a factory installed and field wired 115 volt, 13 amp ground fault service receptacle.

OPTIONAL ROOF CURBS

- Unit shall be mounted on a factory furnished, knocked down and field assembled roof curb. Roof curbs shall be constructed of galvanized steel with a wood nailer strip. Curbs are to be fully gasketed between the curb top and unit bottom with the curb providing full perimeter support, cross structure support and air seal for the unit.

OPTIONAL CONTROLS

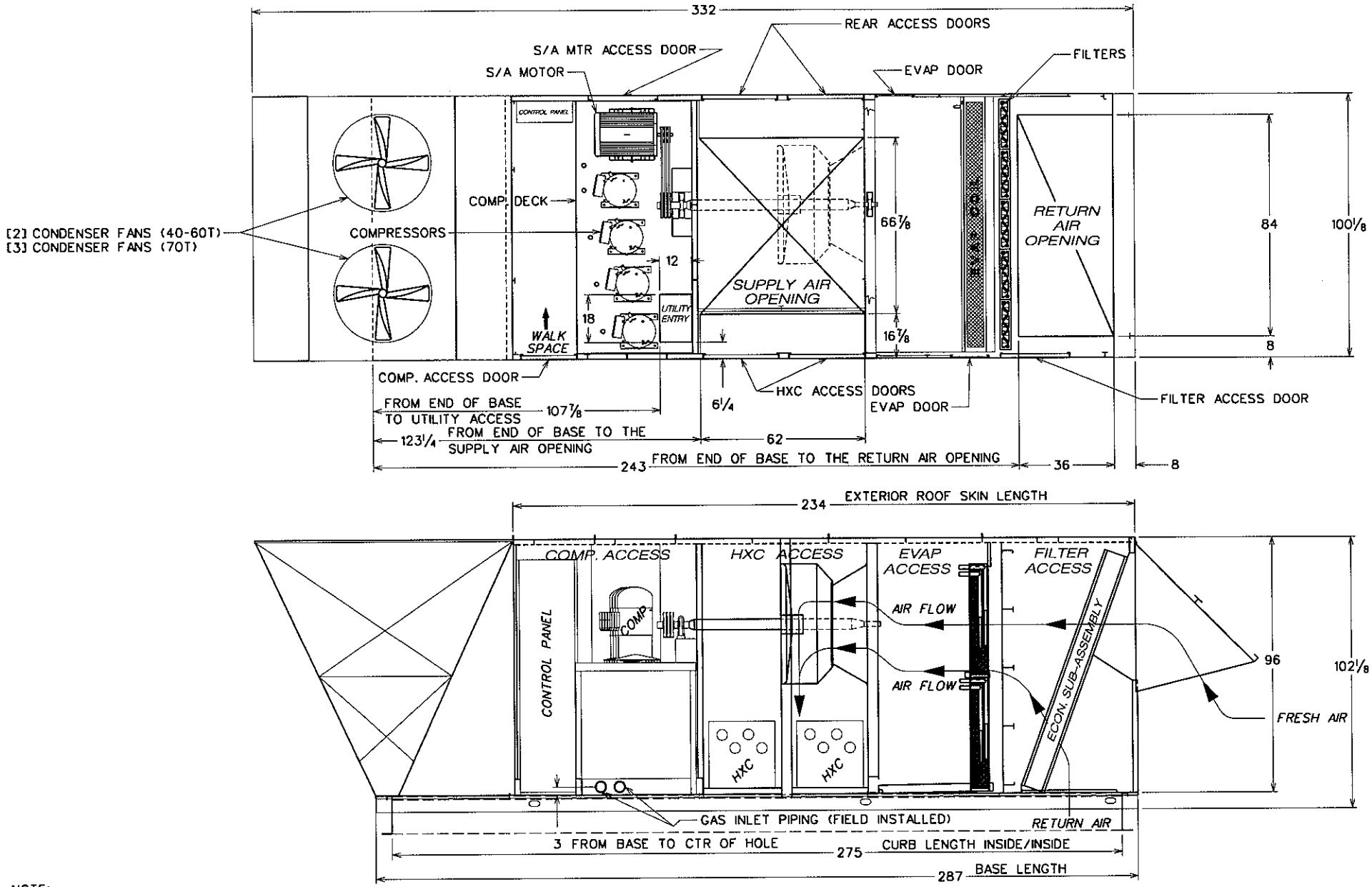
A) Single zone standard mechanical, T874 or equivalent.
B) Single zone electronic with night set back, T7300 or equivalent.
C) Single zone electronic with night set back & integrated modulating economizer function, T7400 or equivalent.
D) VAV electronic controller.
E) VVT electronic controller.
F) Remote monitoring and/or control panels, W950 or equivalent.
G) Staging and/or step control for electric heat.



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

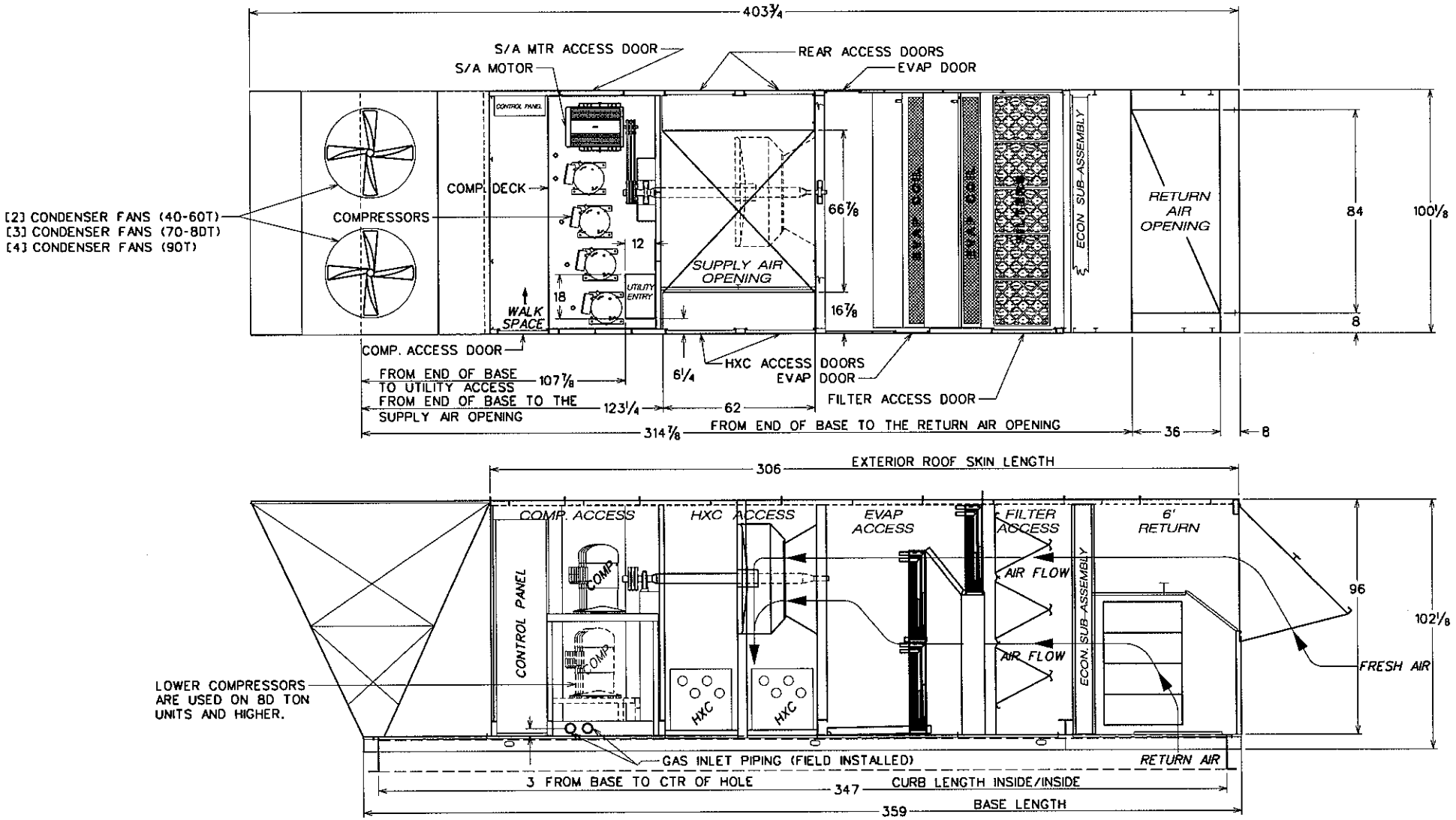
A1

RF 40–70 TON STD.



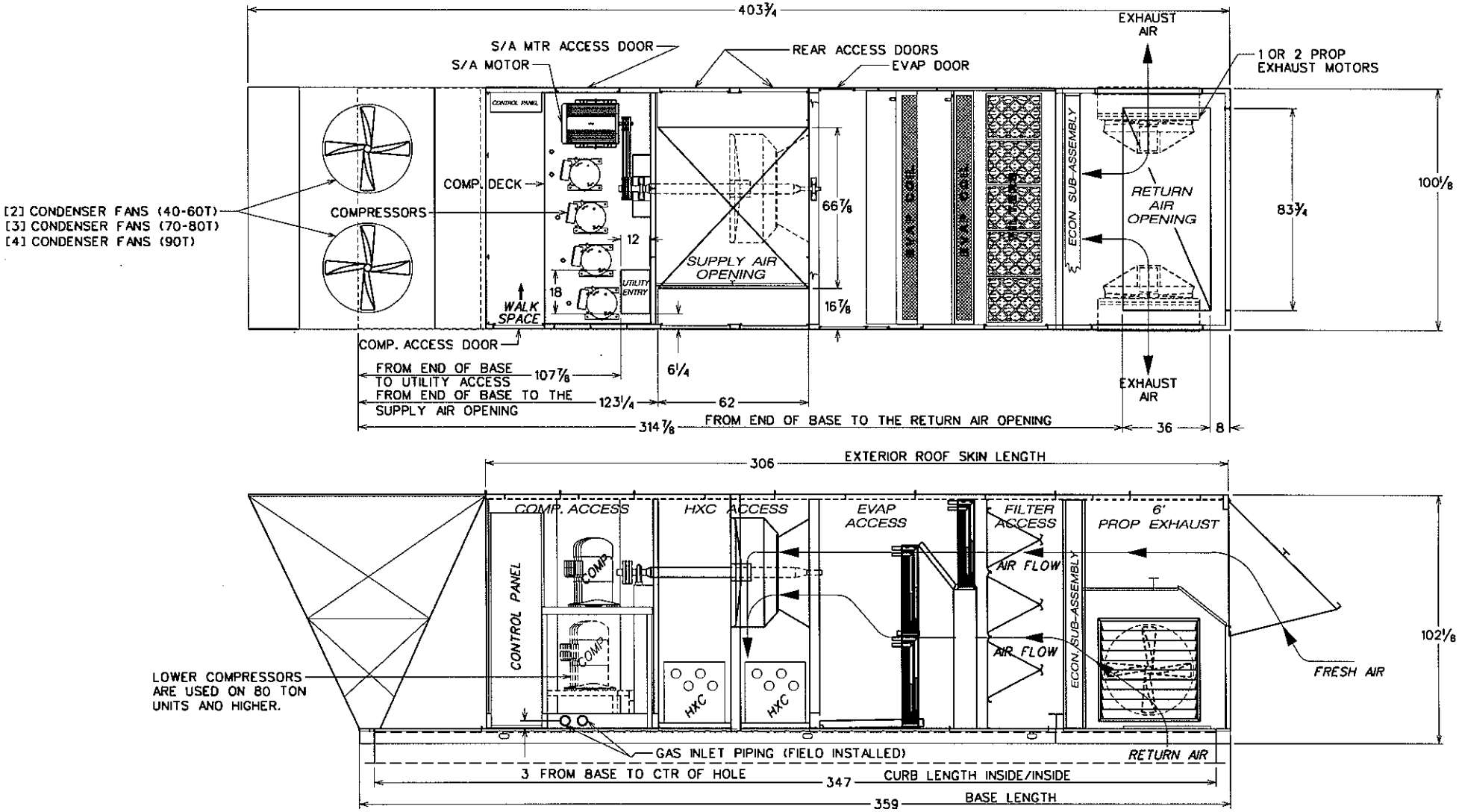
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–70 TON STD. w/INTEGRAL ECON.



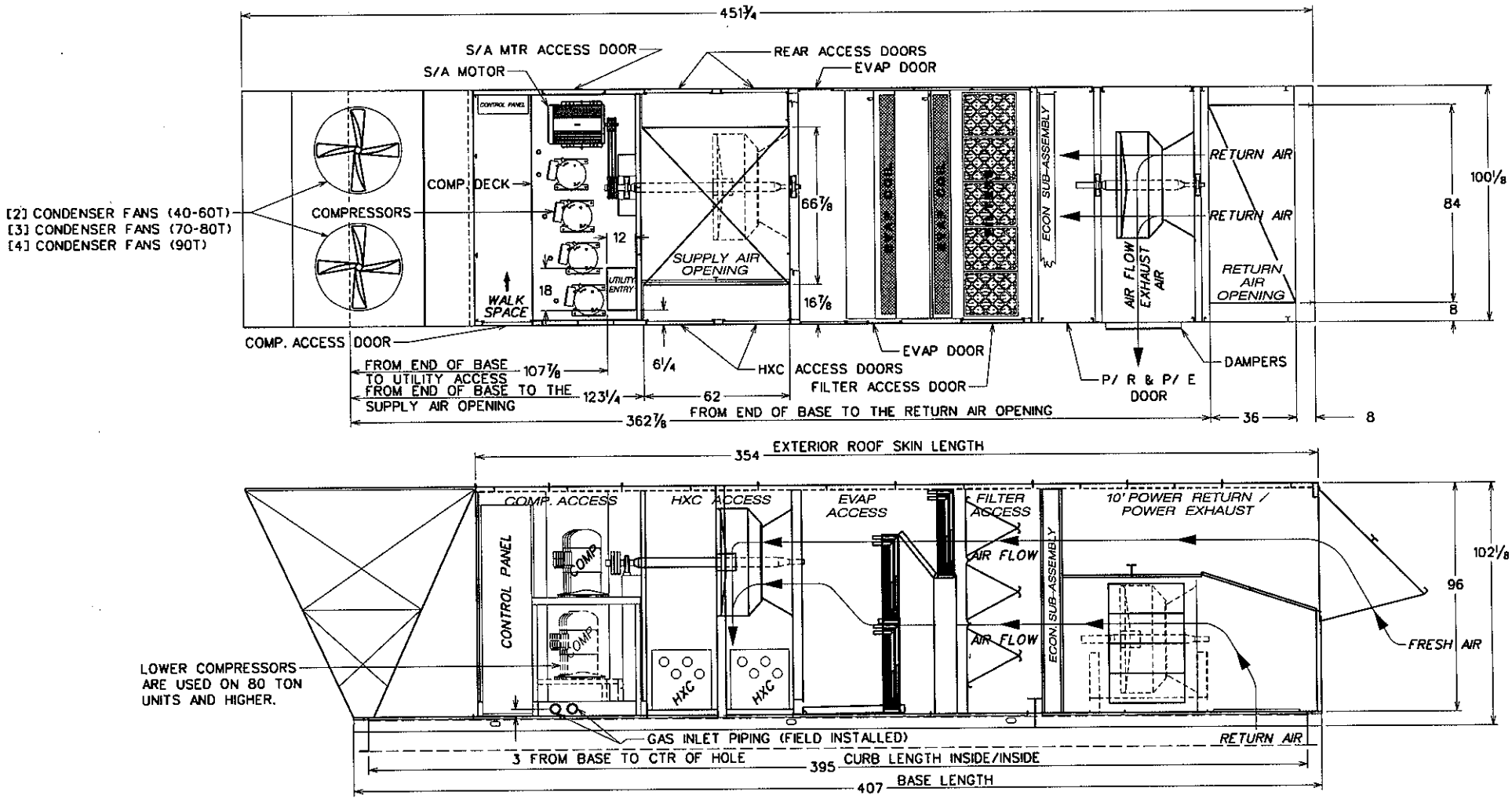
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–90 TON W/6FT RETURN



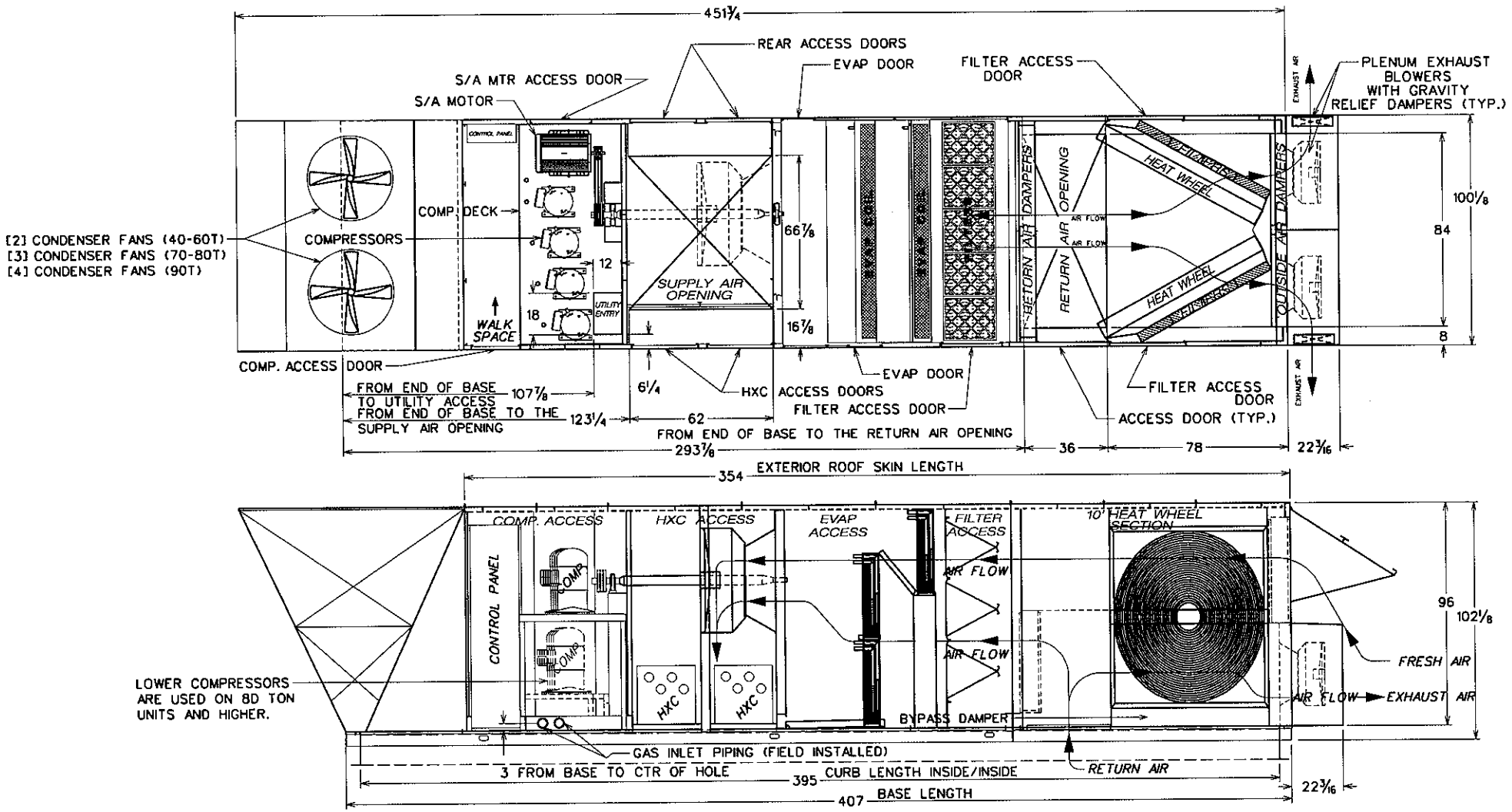
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–90 TON W/6FT PROP EXH.



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

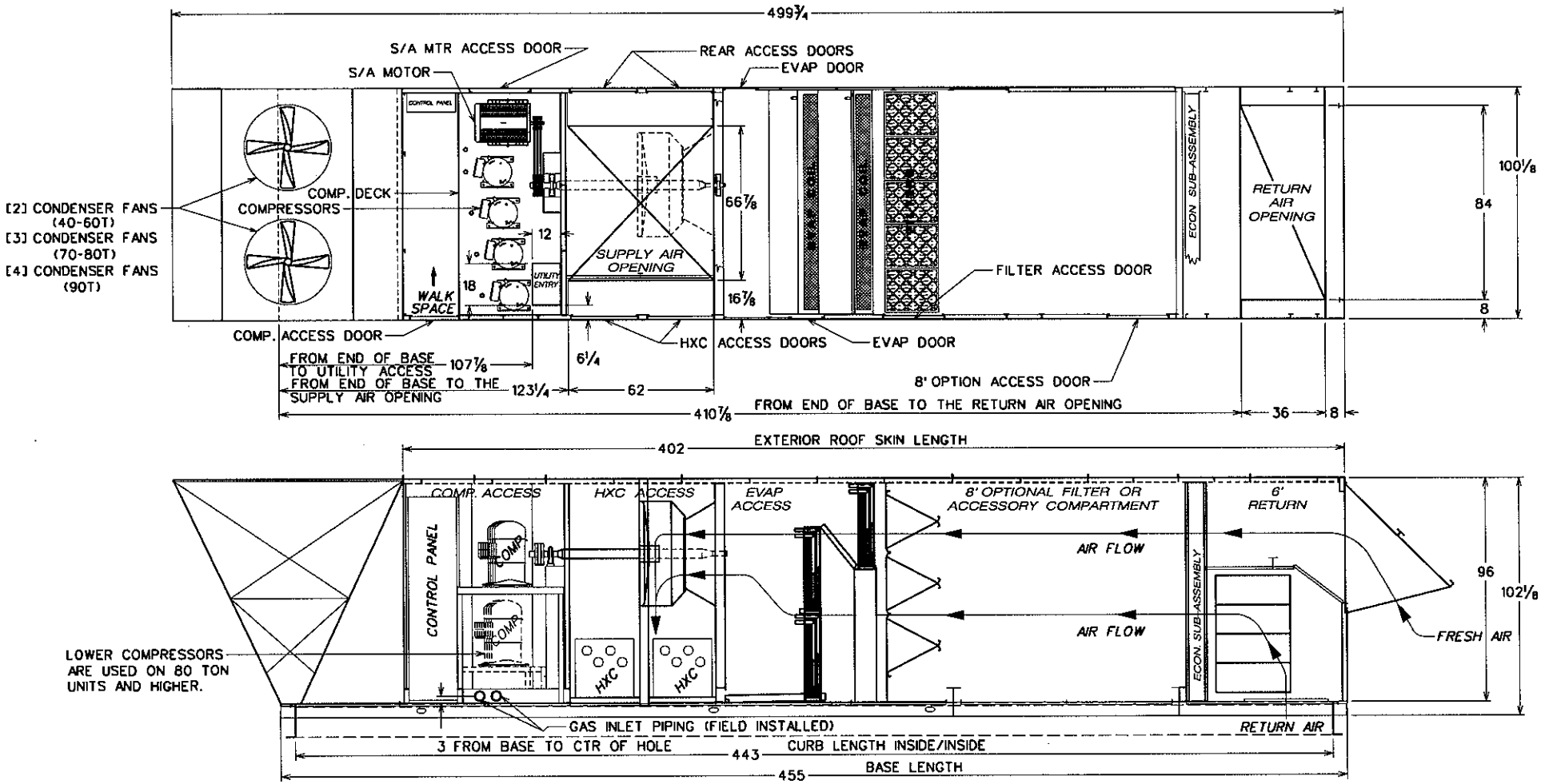
RF 40–90 TON W/10FT RETURN



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

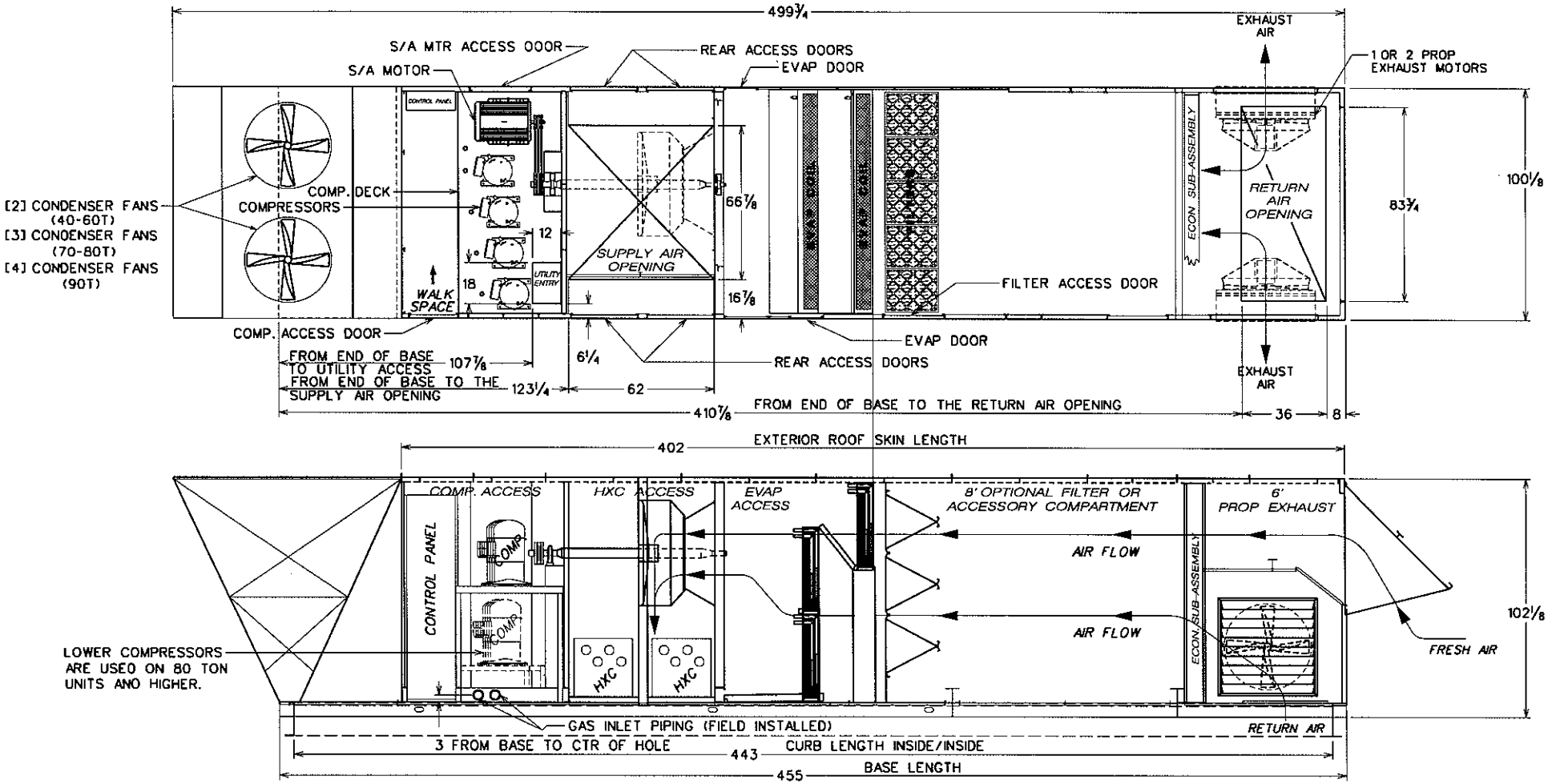
RF 40–90 TON W/10FT HEAT WHEEL (12,000 – 24,000 HEAT WHEEL CFM)

(CONFIGURATION FOR 0 – 12,000 HEAT WHEEL CFM ON A32)



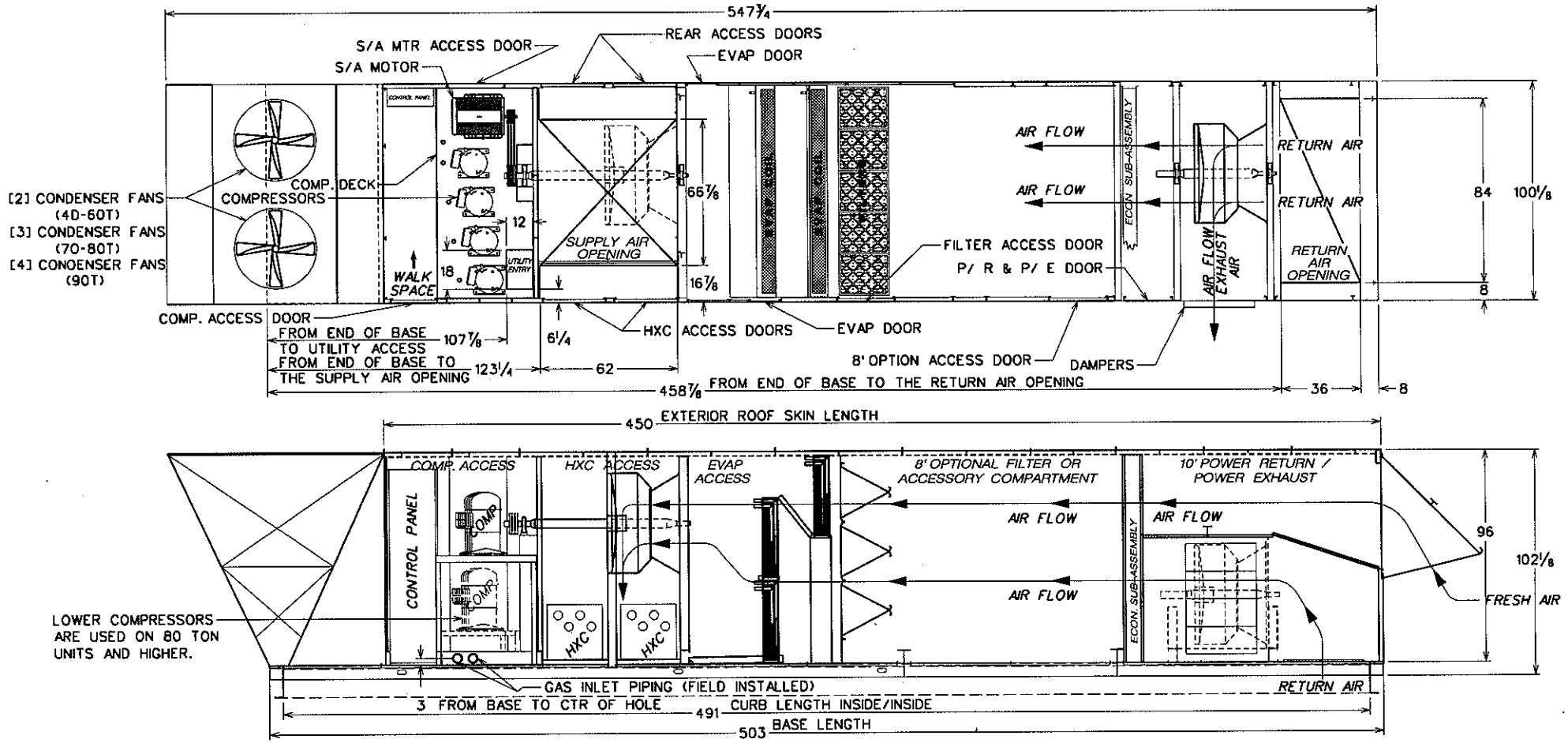
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–90 TON W/6FT RETURN AND 8FT OPTION



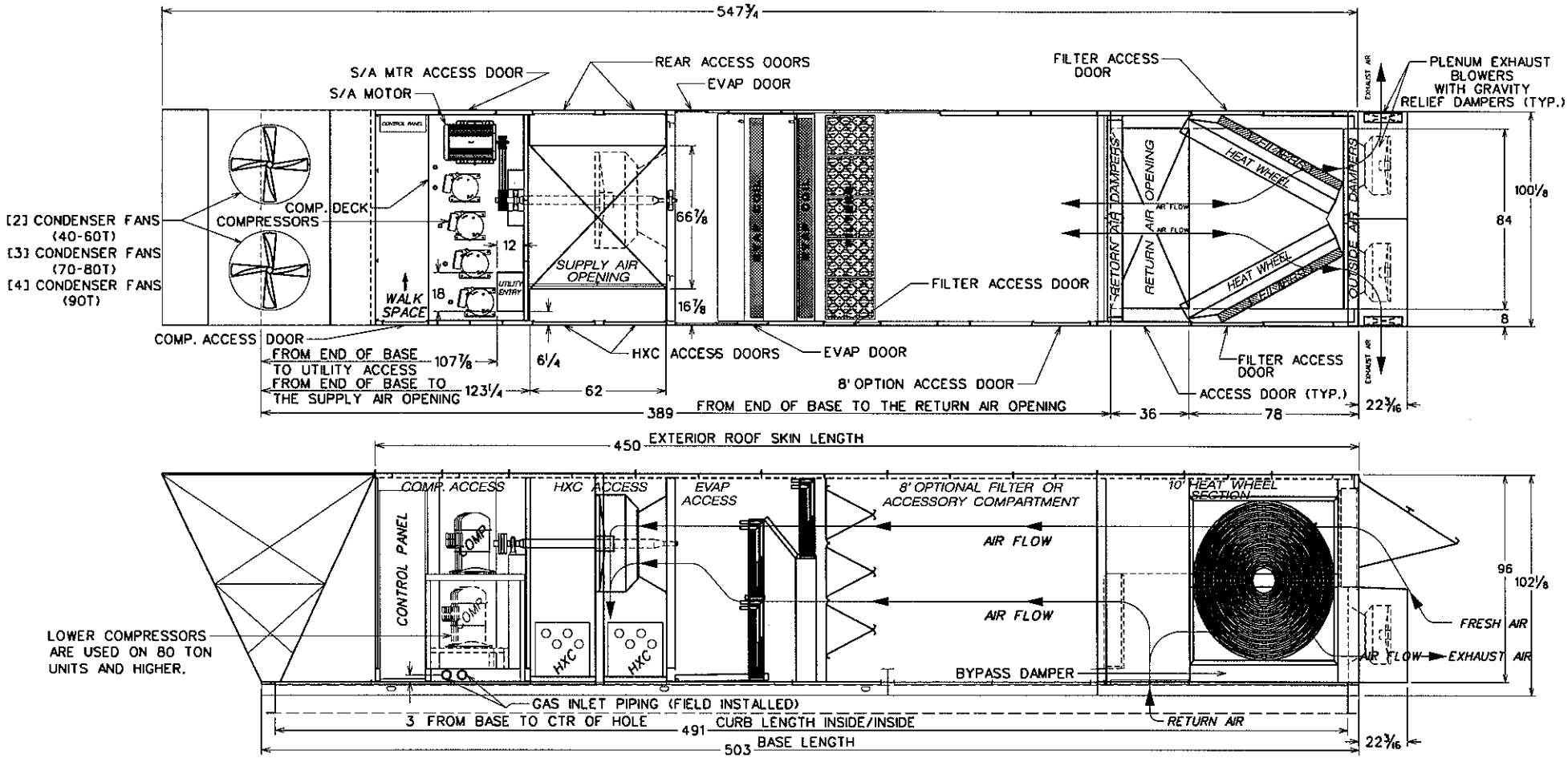
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–90 TON W/6FT PROP EXH. AND 8FT OPTION



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

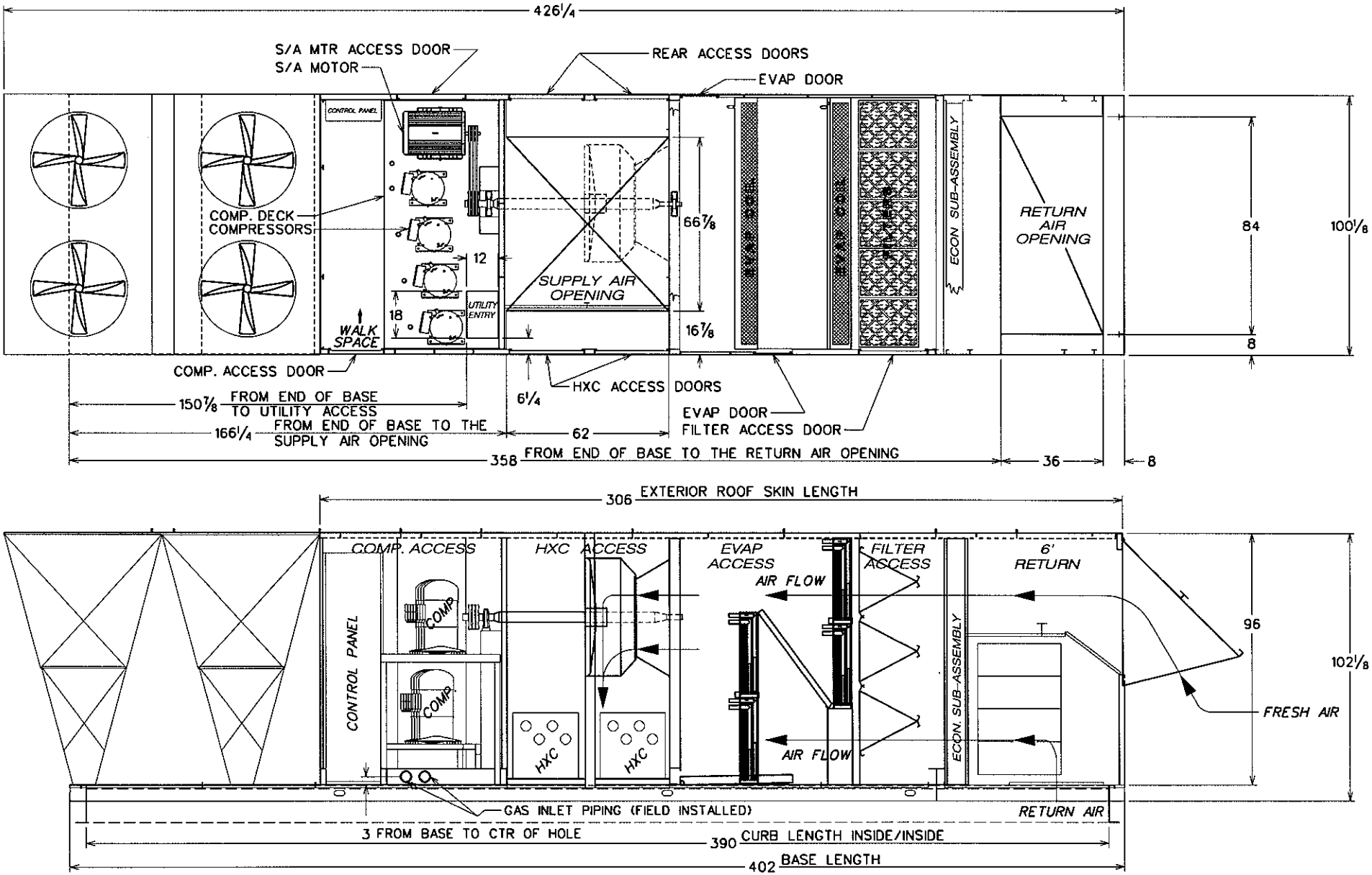
RF 40–90 TON W/10FT RETURN AND 8FT OPTION



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

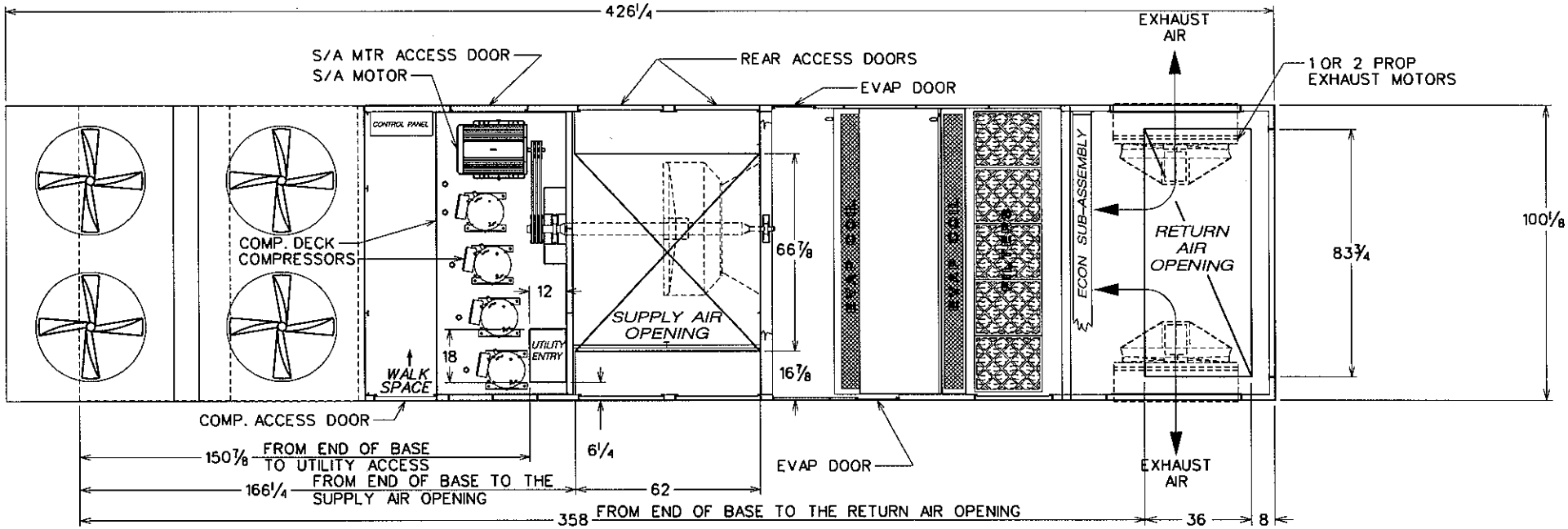
RF 40–90 TON W/10FT HEAT WHEEL AND 8FT OPTION (12,000 – 24,000 HEAT WHEEL CFM)

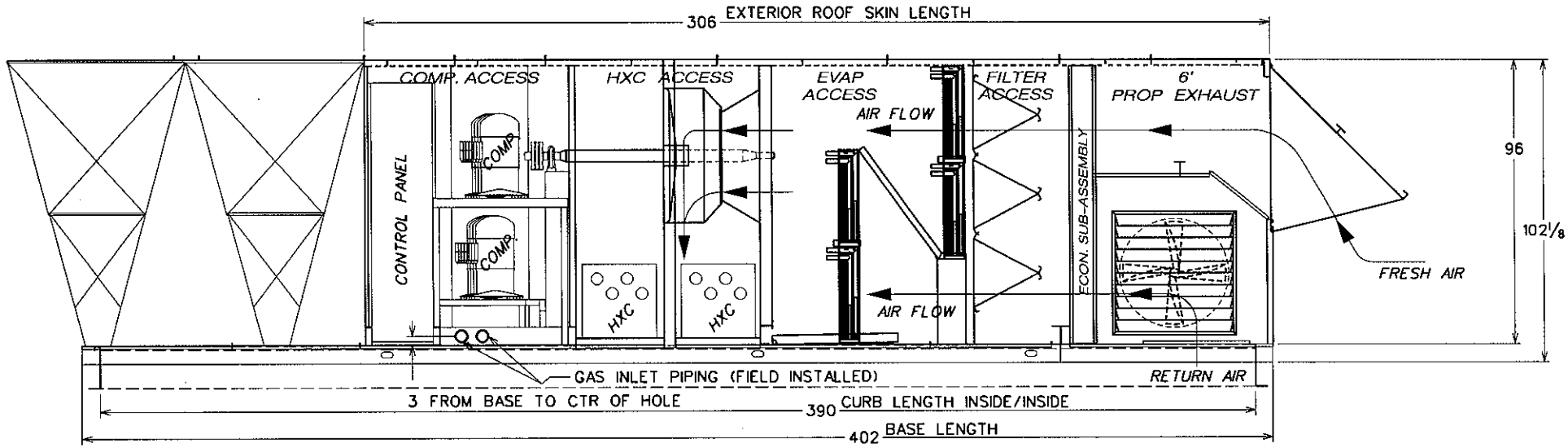
(CONFIGURATION FOR 0 – 12,000 HEAT WHEEL CFM ON A32)



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

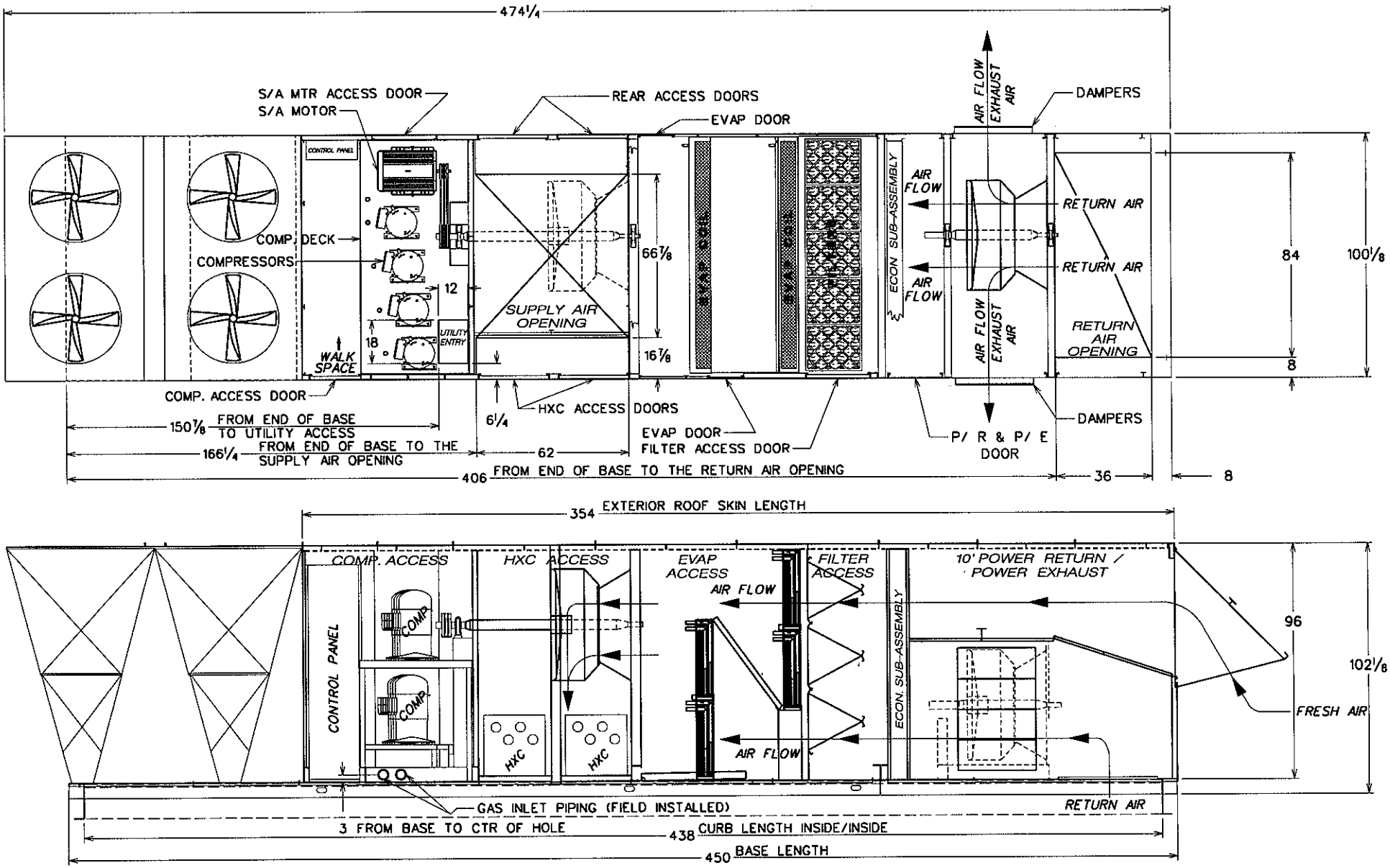
RF 110–130 TON STD.





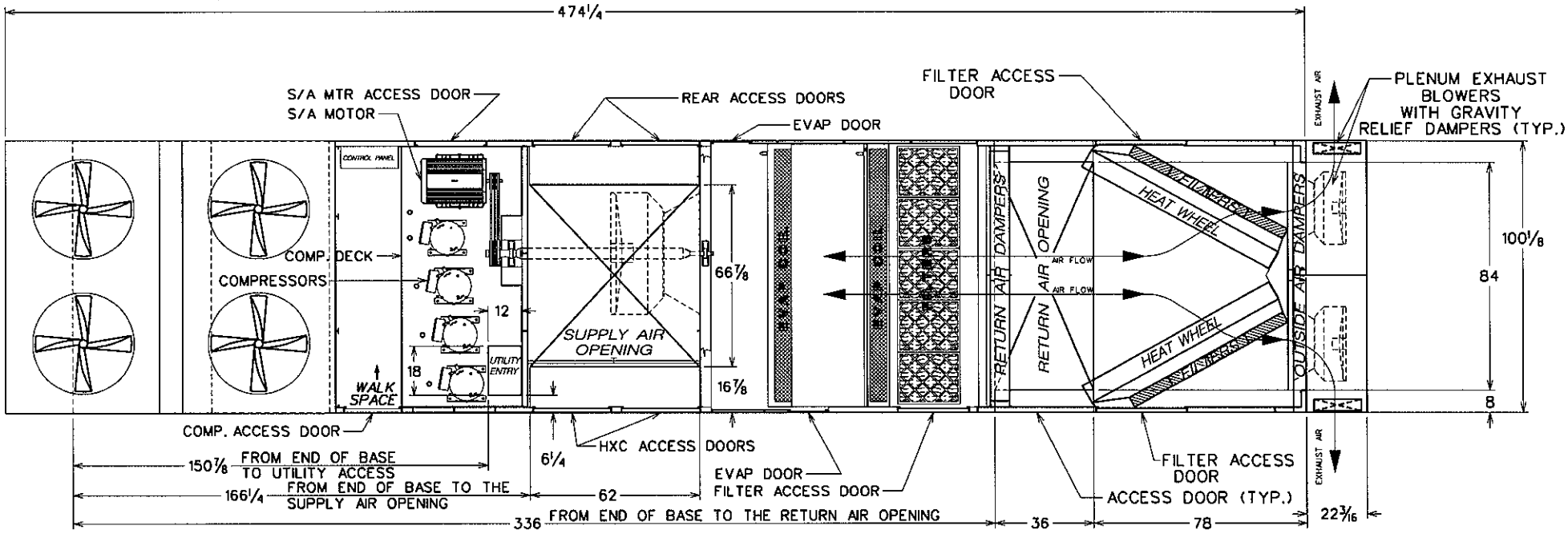
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 110–130 TON STD. W/PROP EXH.



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

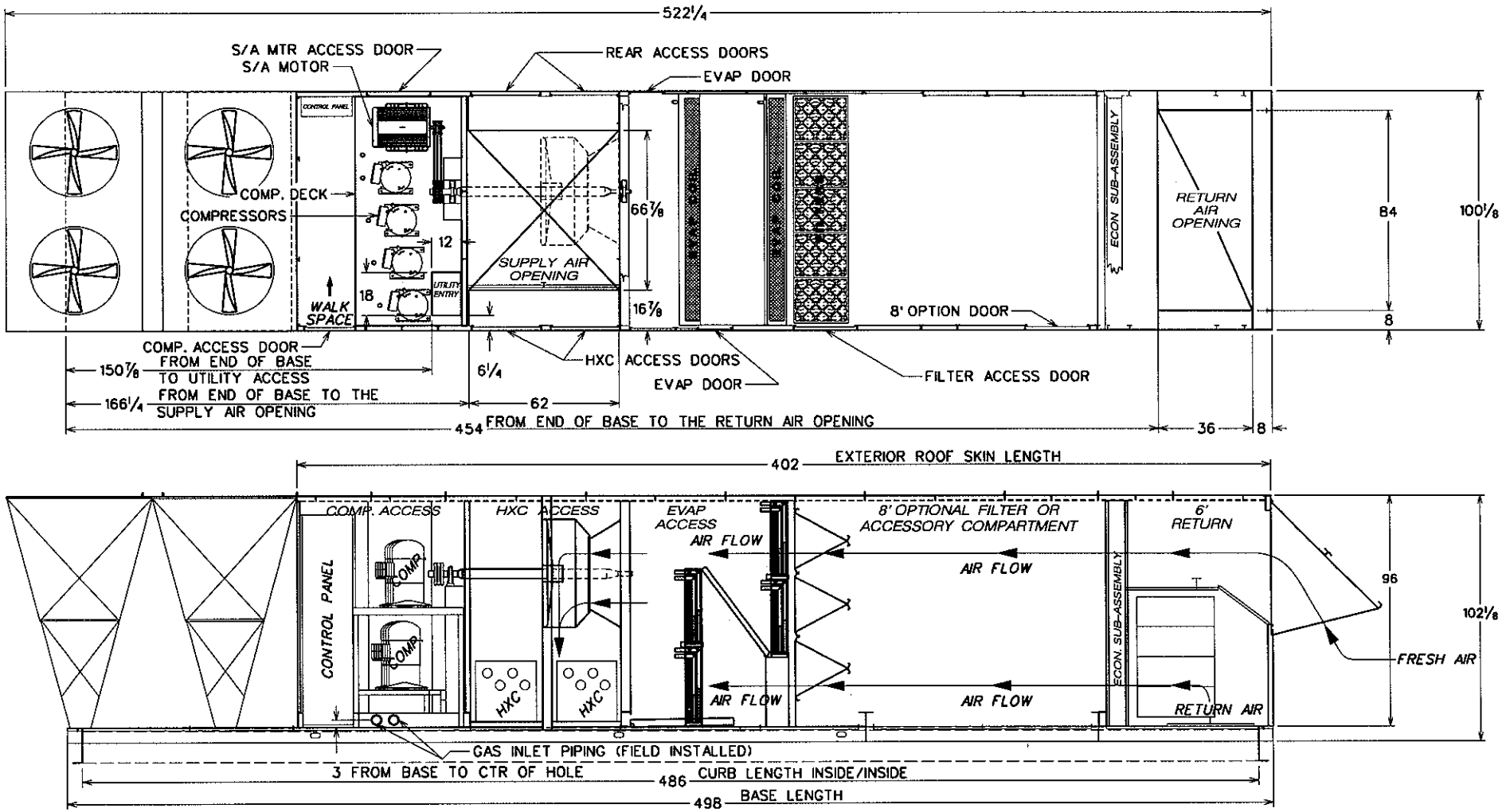
RF 110–130 TON W/10FT RETURN



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

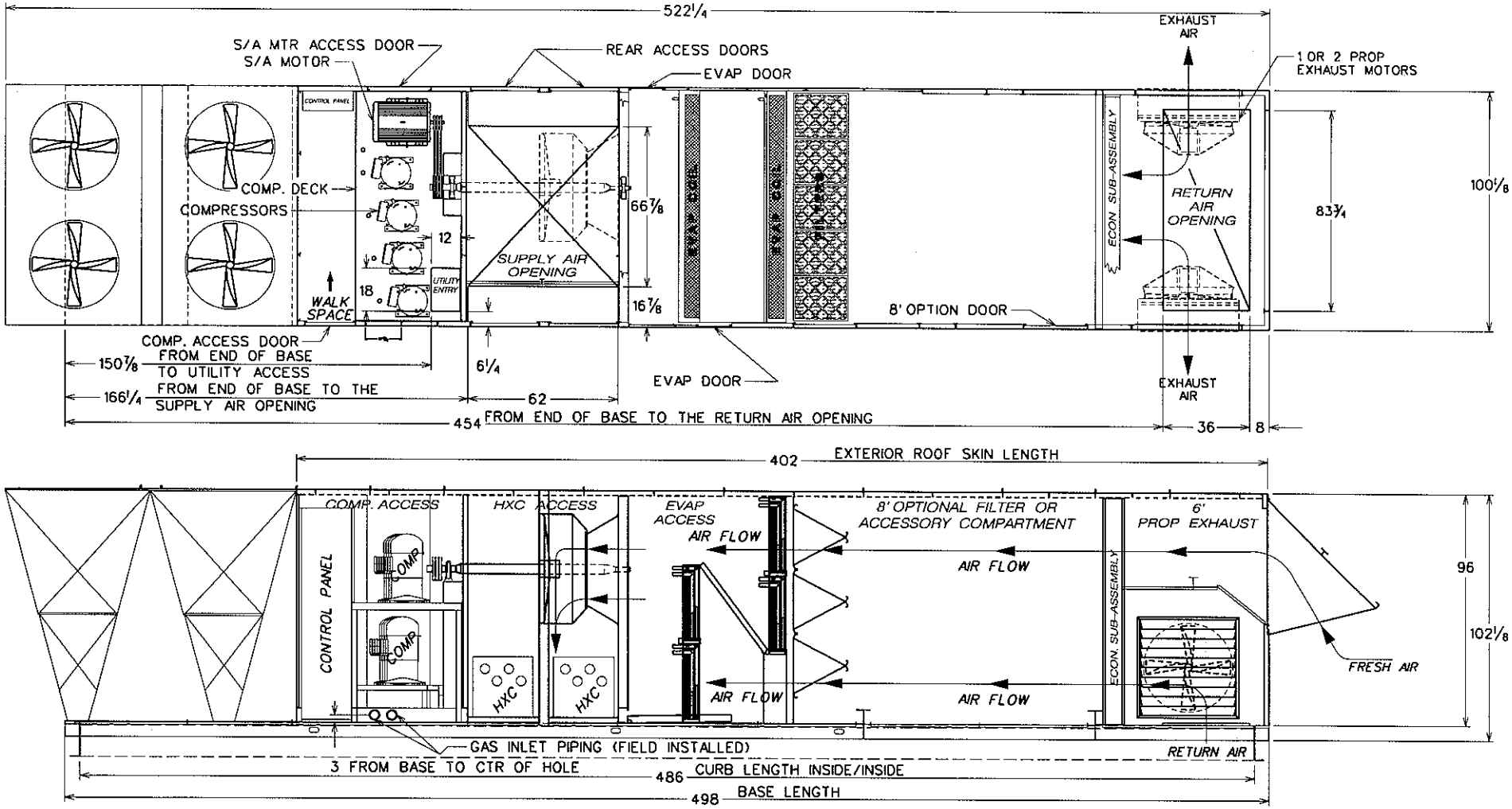
RF 110–130 TON W/10FT HEAT WHEEL (12,000 – 24,000 HEAT WHEEL CFM)

(CONFIGURATION FOR 0 – 12,000 HEAT WHEEL CFM ON A32)



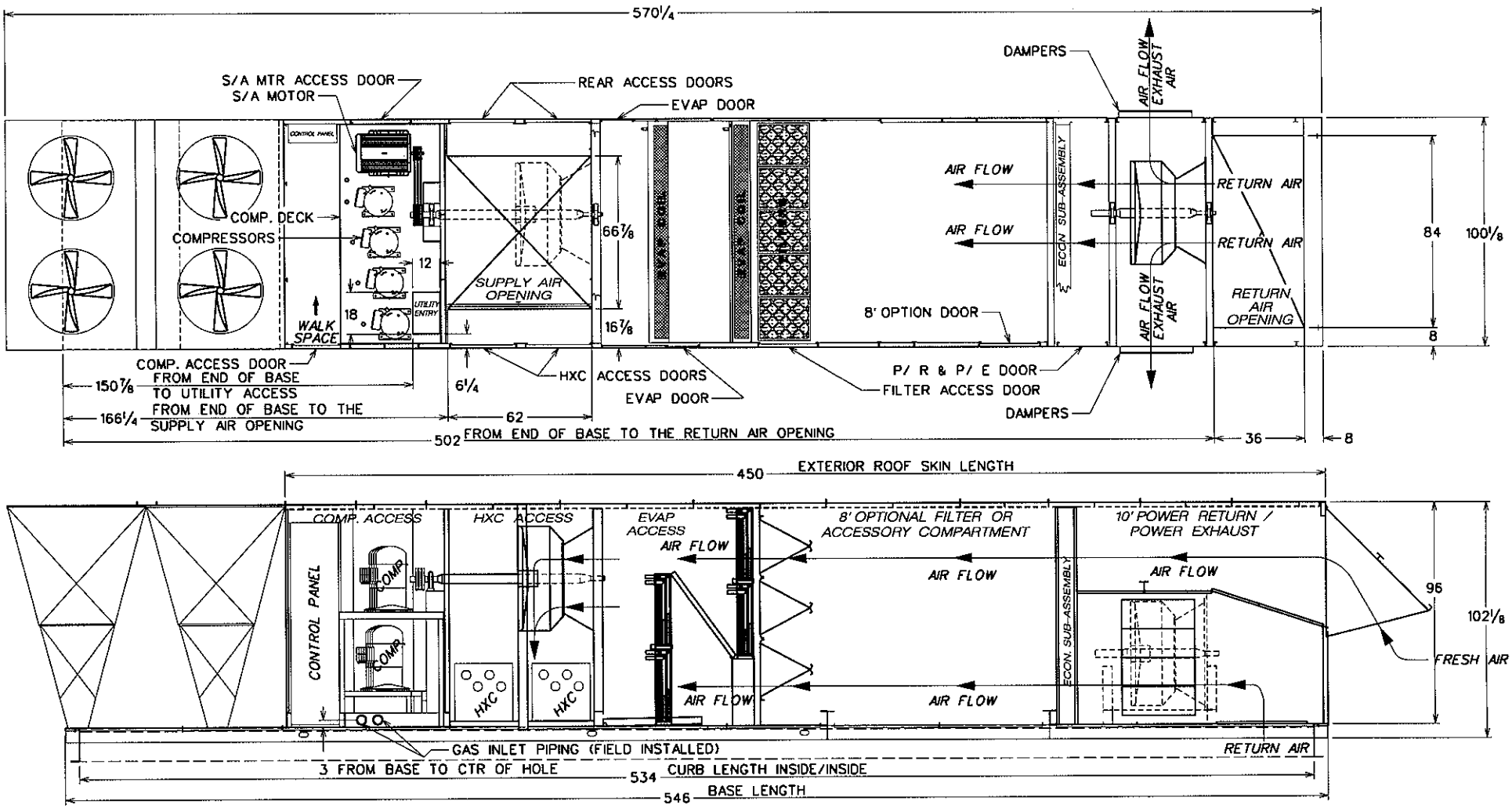
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 110–130 TON W/6FT RETURN AND 8FT OPTION



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 110–130 TON W/6FT PROP EXH. AND 8FT OPTION

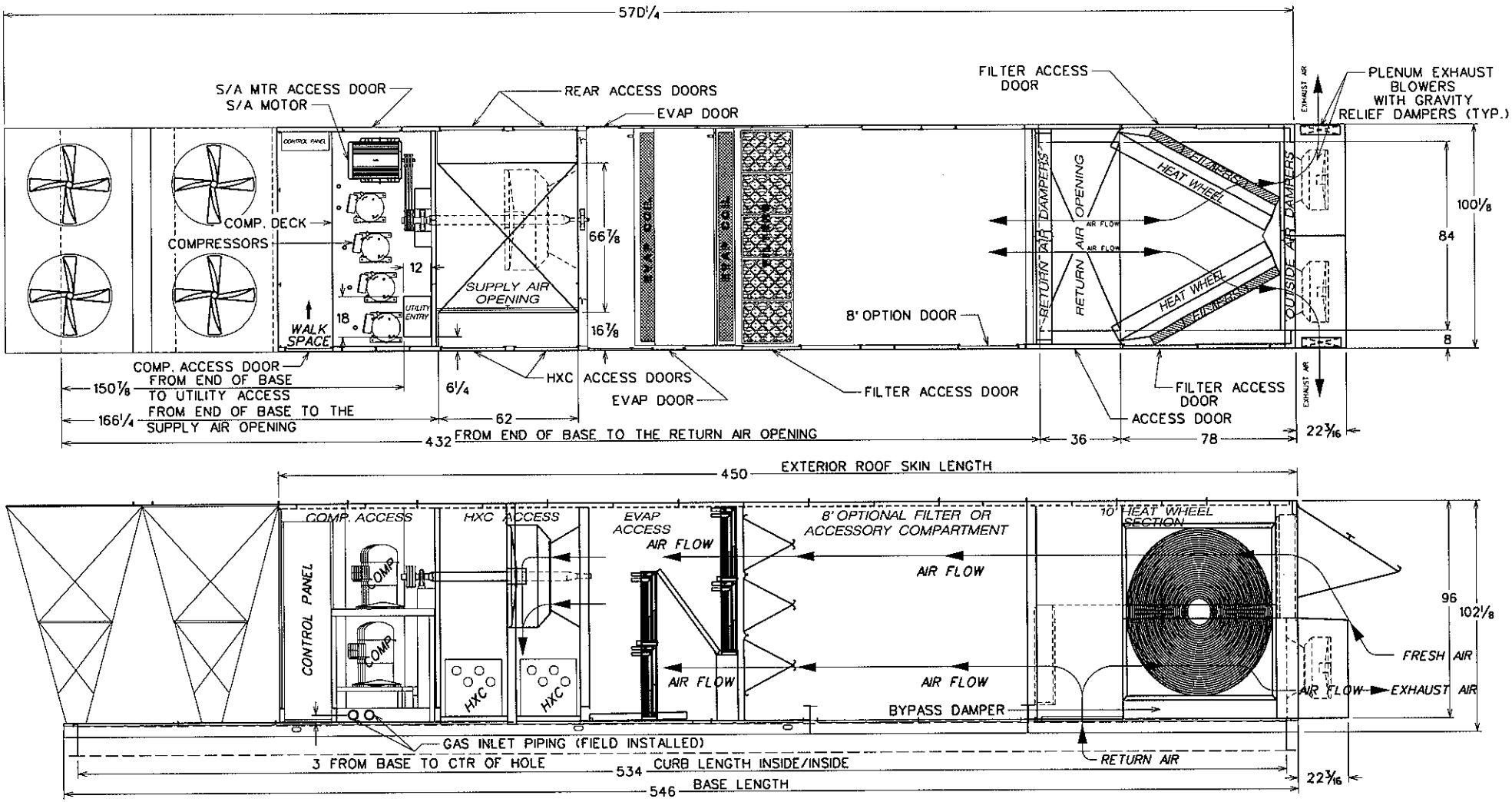


NOTE:

FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES. CLEARANCE AROUND UNIT.

FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

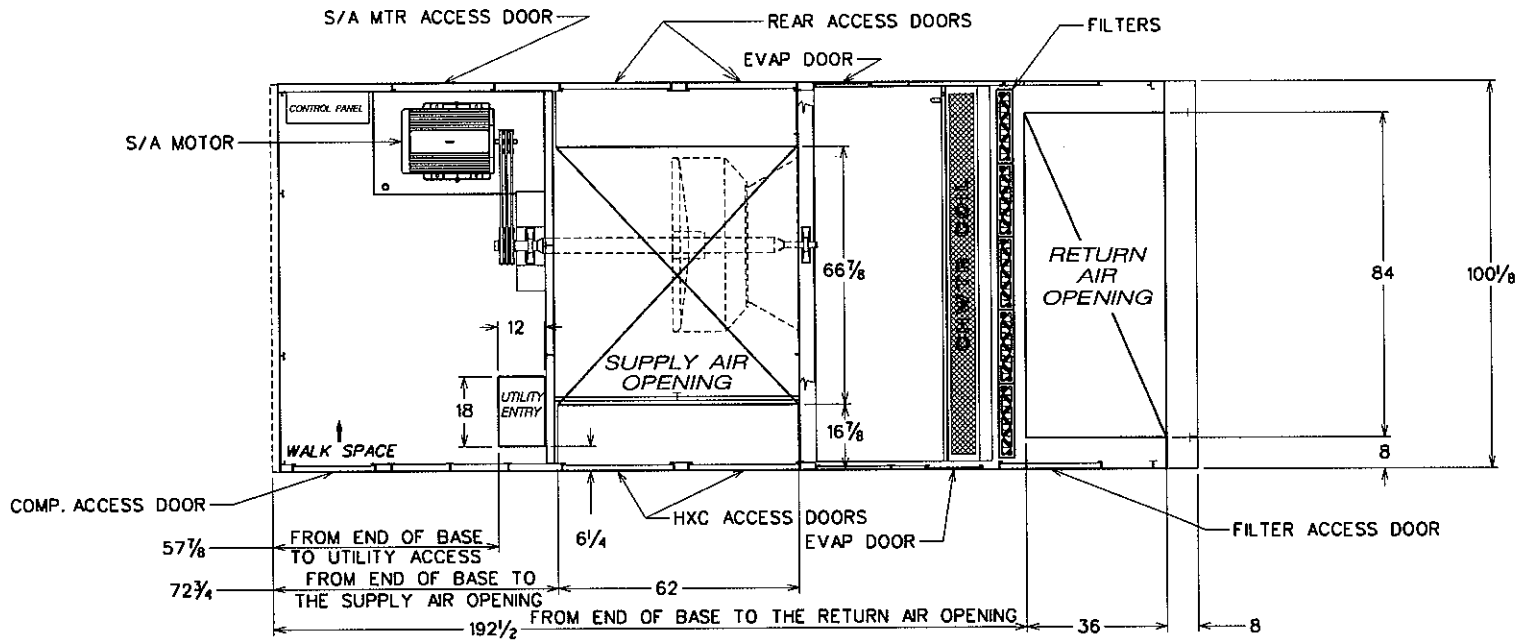
RF 110–130 TON W/10FT RETURN AND 8FT OPTION

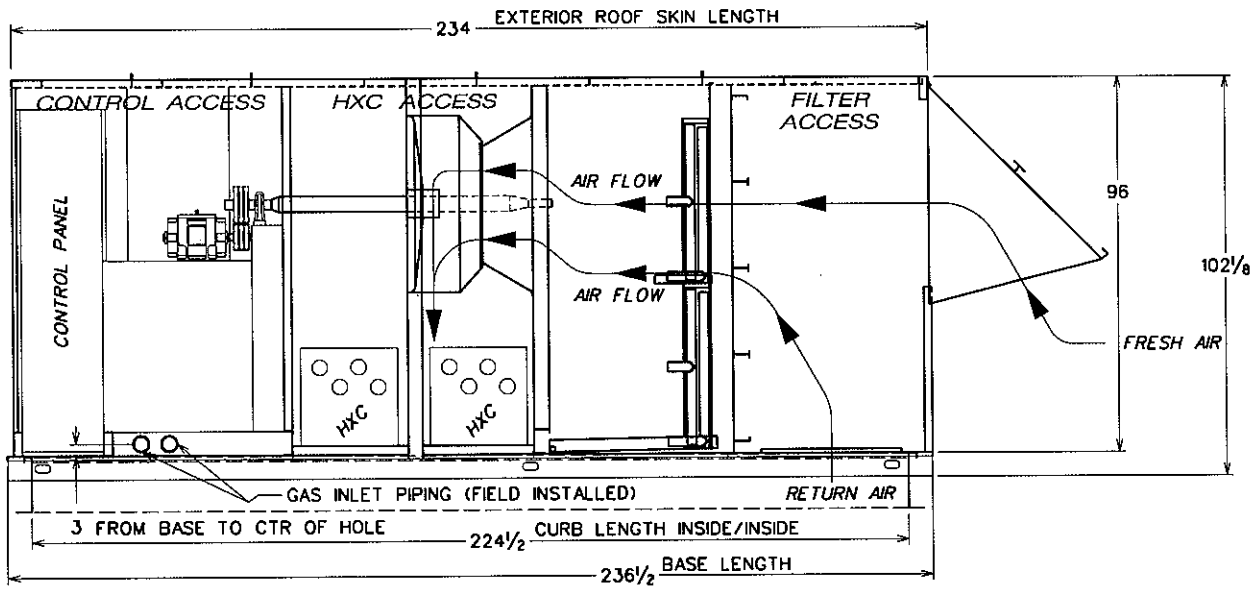


NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 110–130 TON W/10FT HEAT WHEEL AND 8FT OPTION (12,000 – 24,000 HEAT WHEEL CFM)

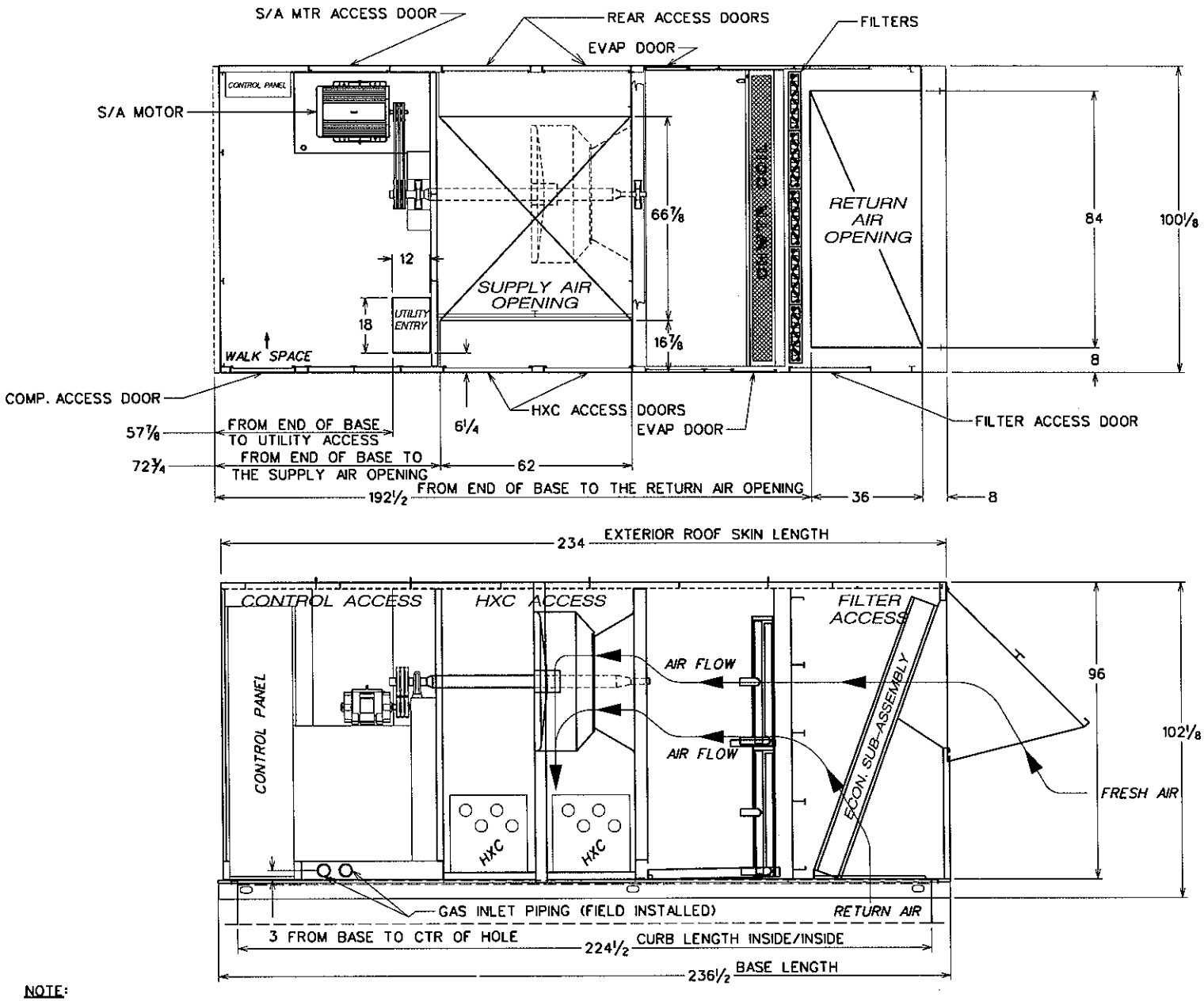
(CONFIGURATION FOR 0 – 12,000 HEAT WHEEL CFM ON A32)





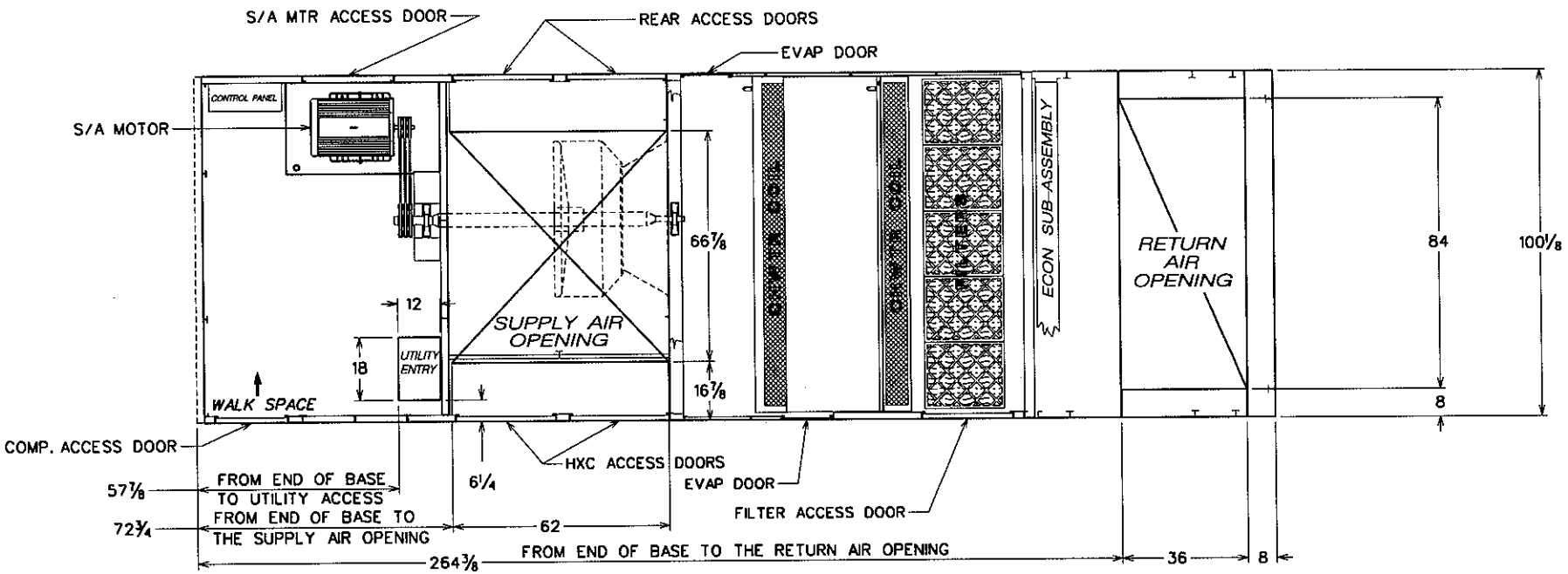
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

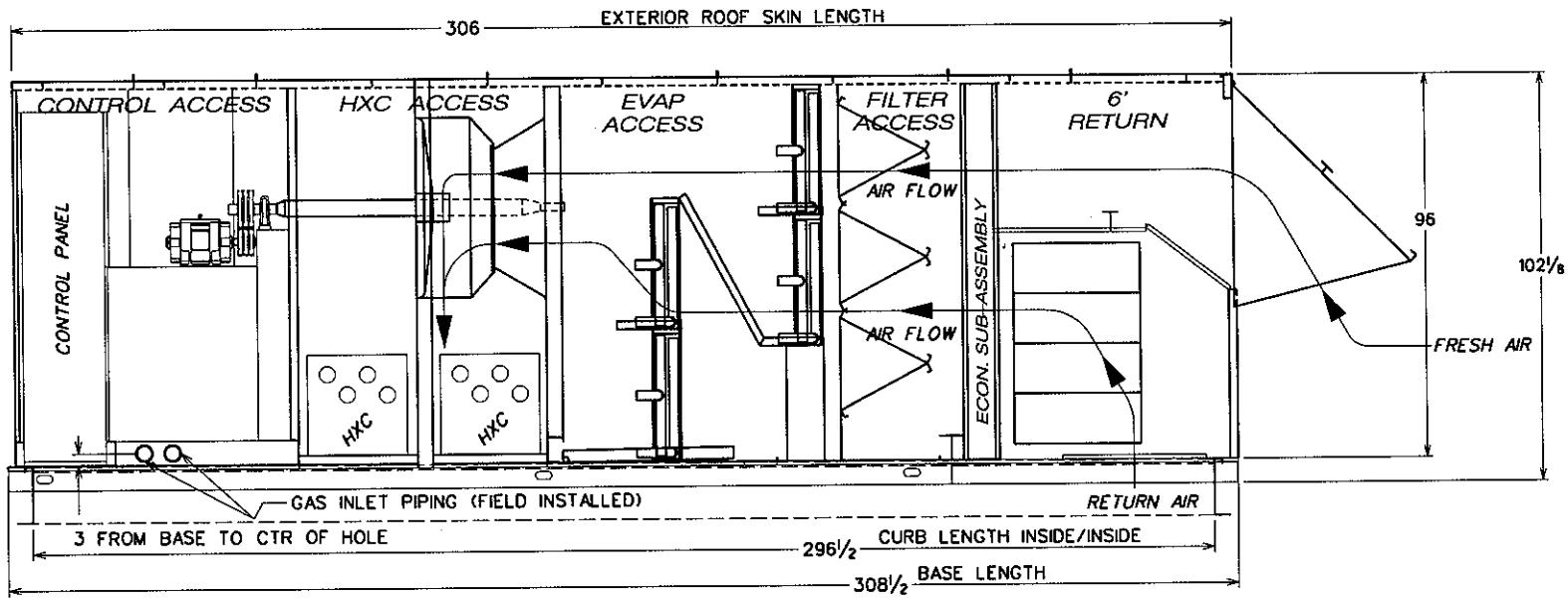
RF 40–70 TON AIR HNDLR



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

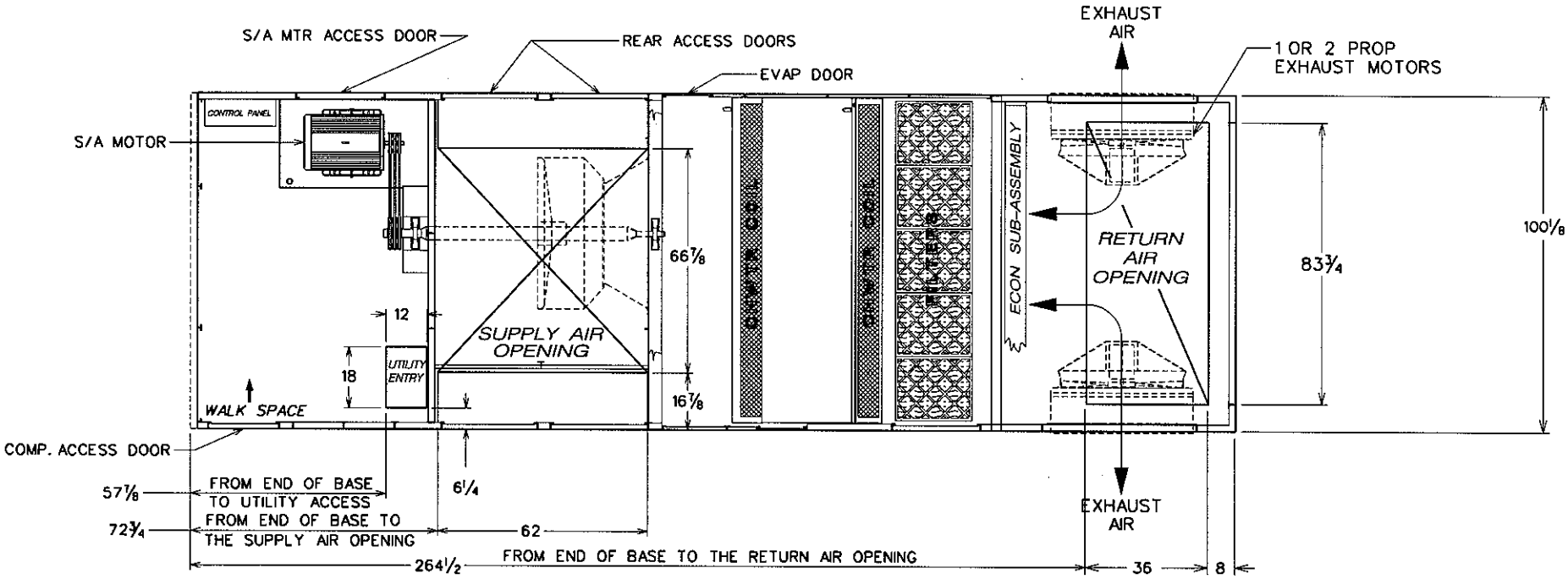
RF 40–70 TON AIR HNDLR w/INTEGRAL ECON.

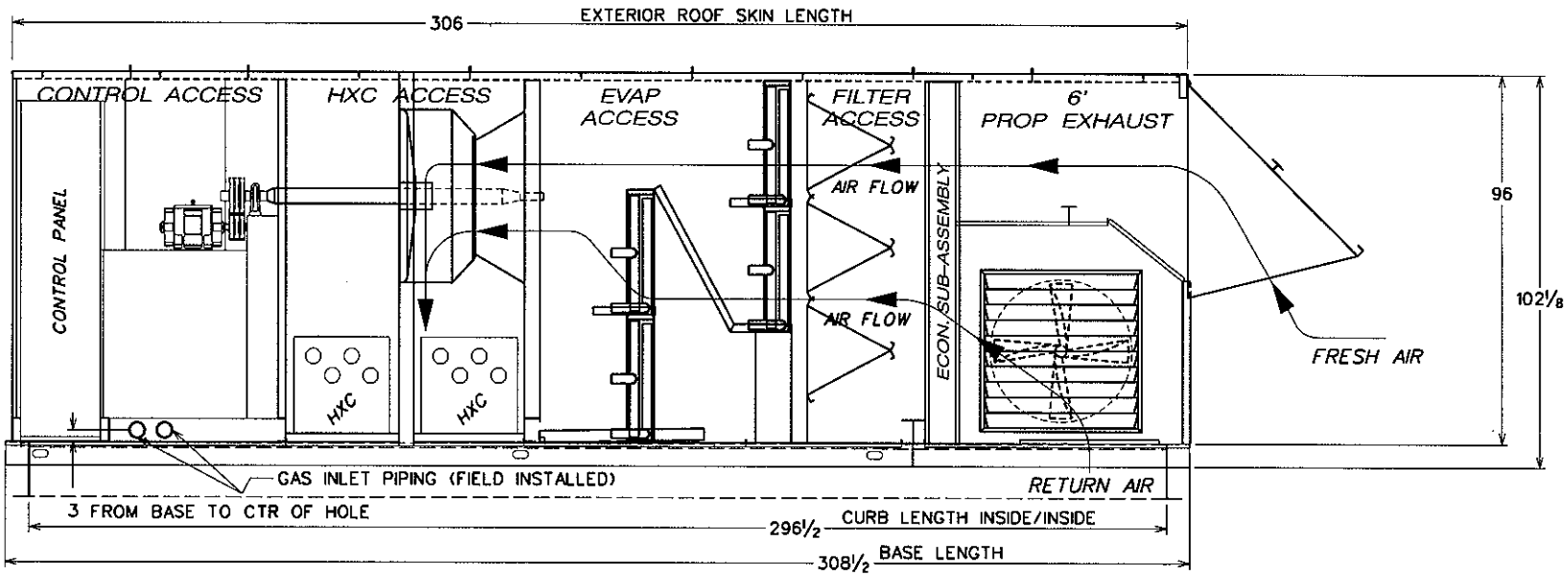




NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–130 TON AIR HNDLR W/6FT RETURN

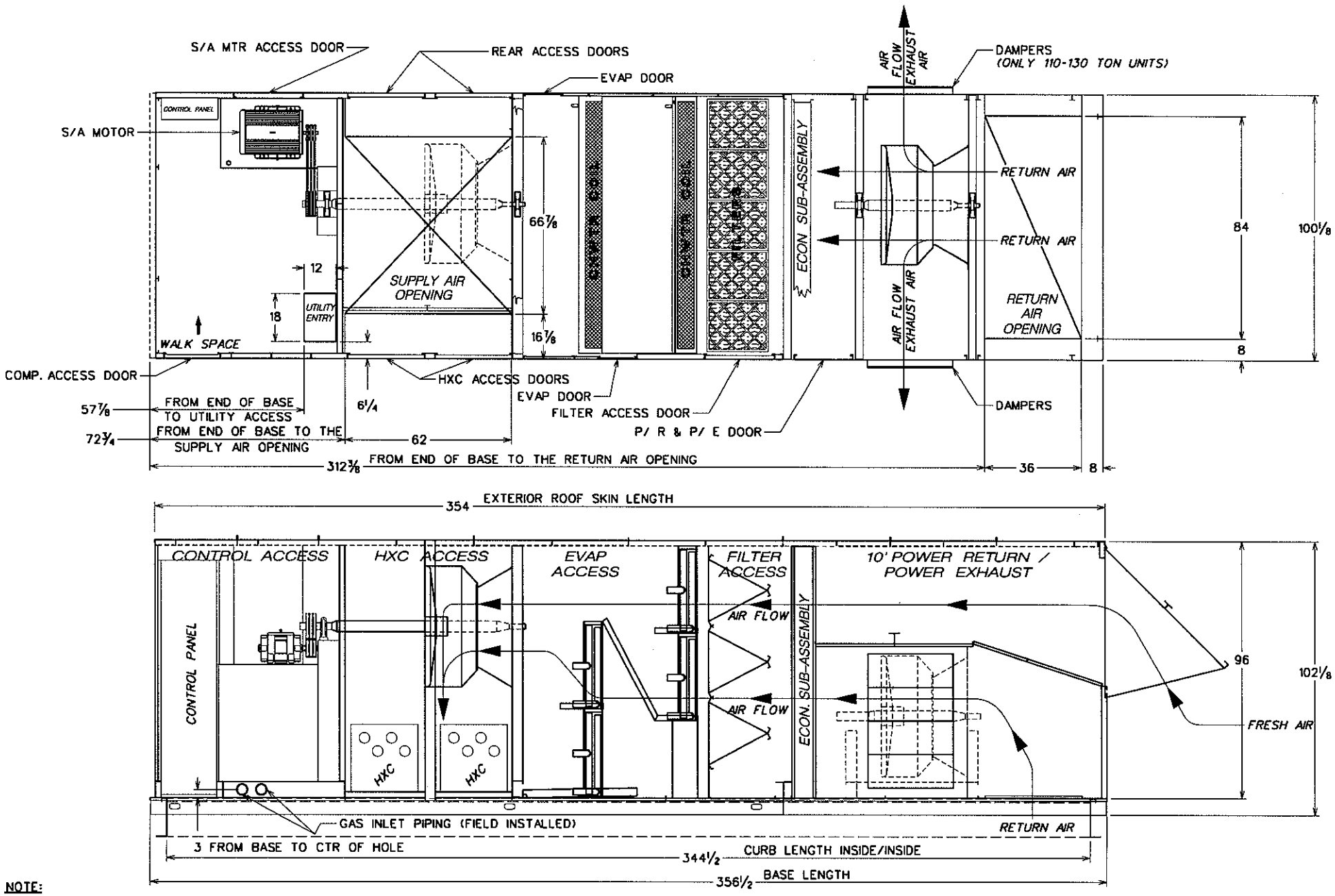




NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

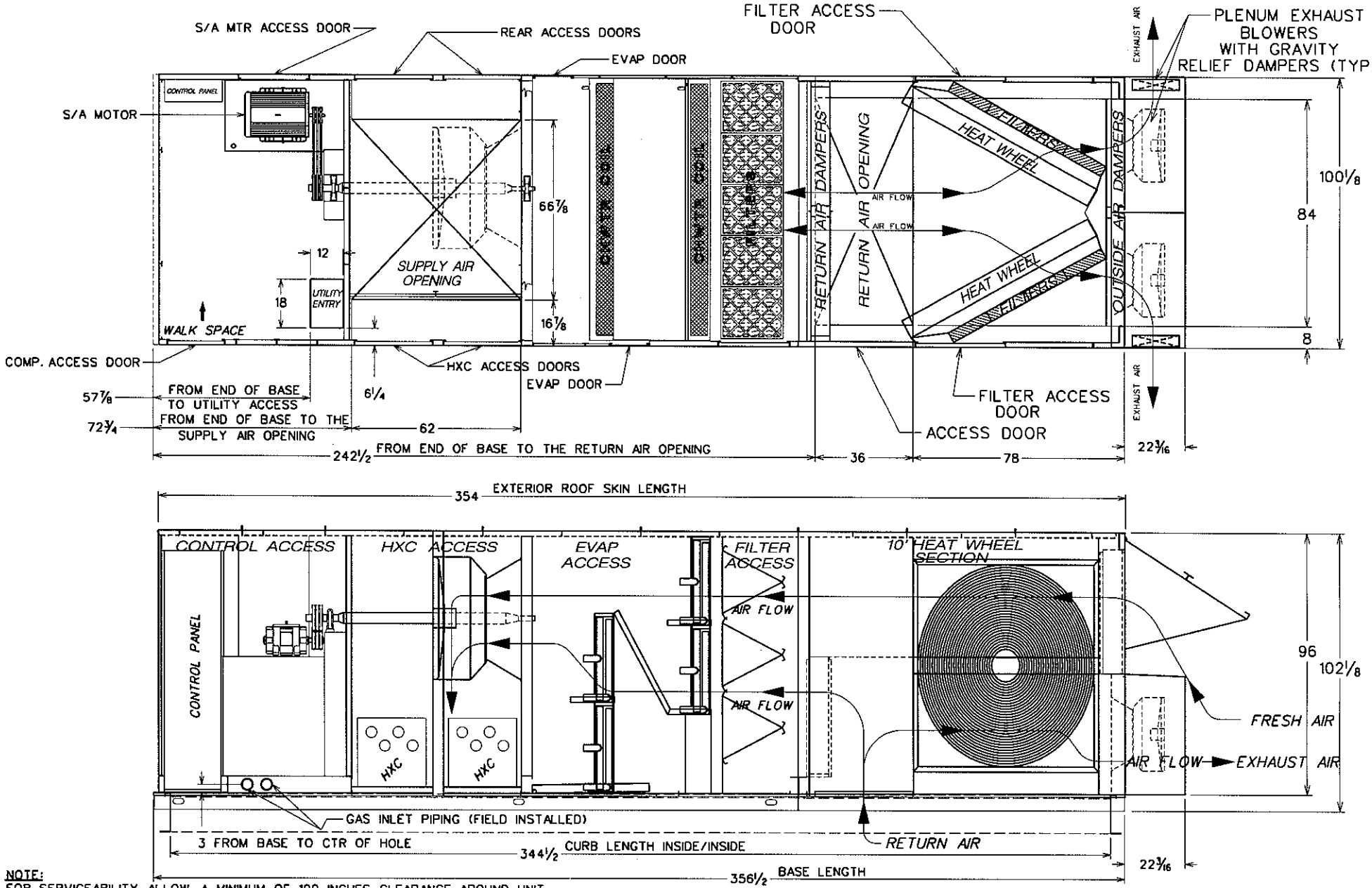
A22

RF 40–130 TON AIR HNDLR W/6FT PROP EXH.



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 10D INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

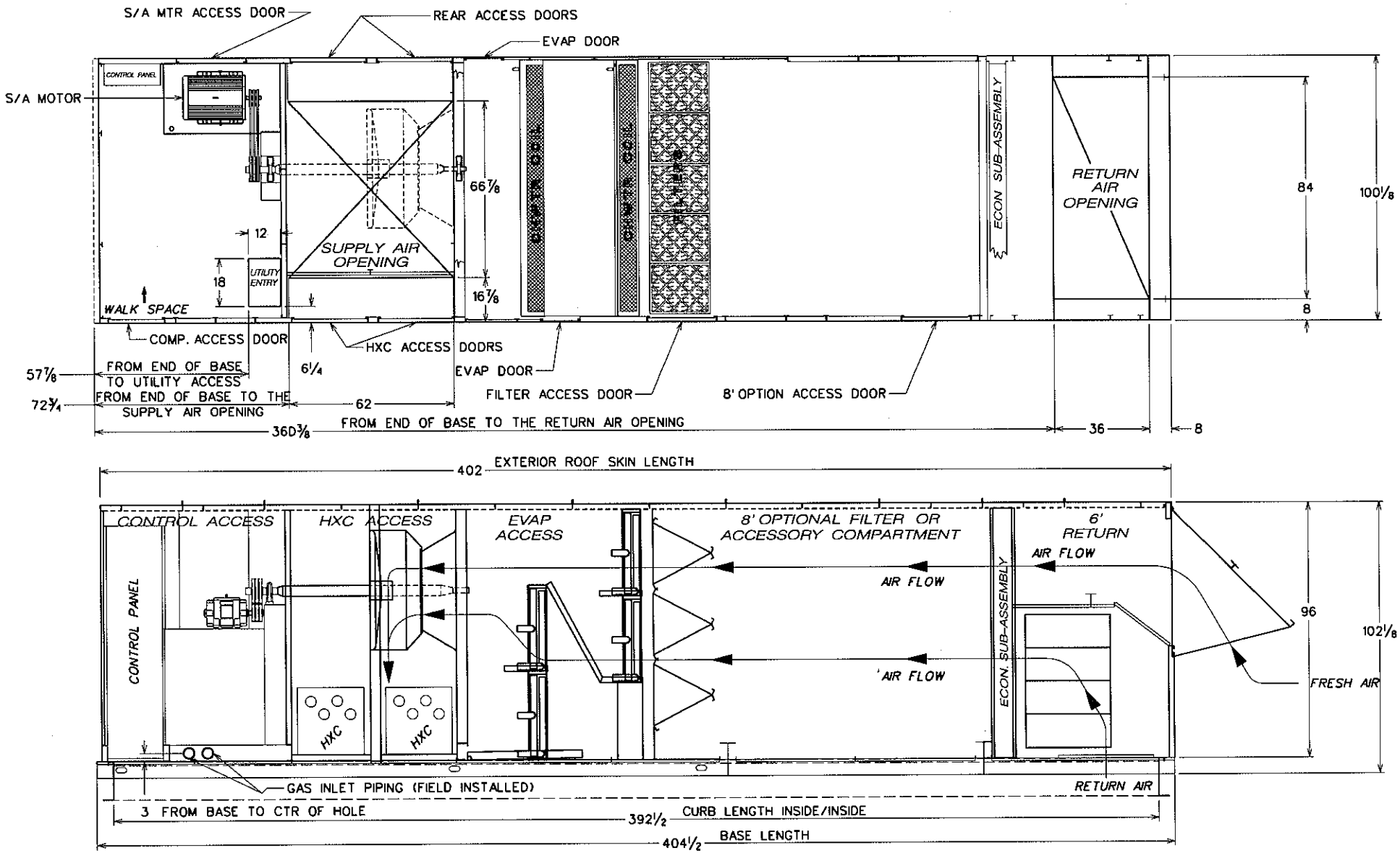
RF 40–130 TON AIR HNDLR W/10FT RETURN



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

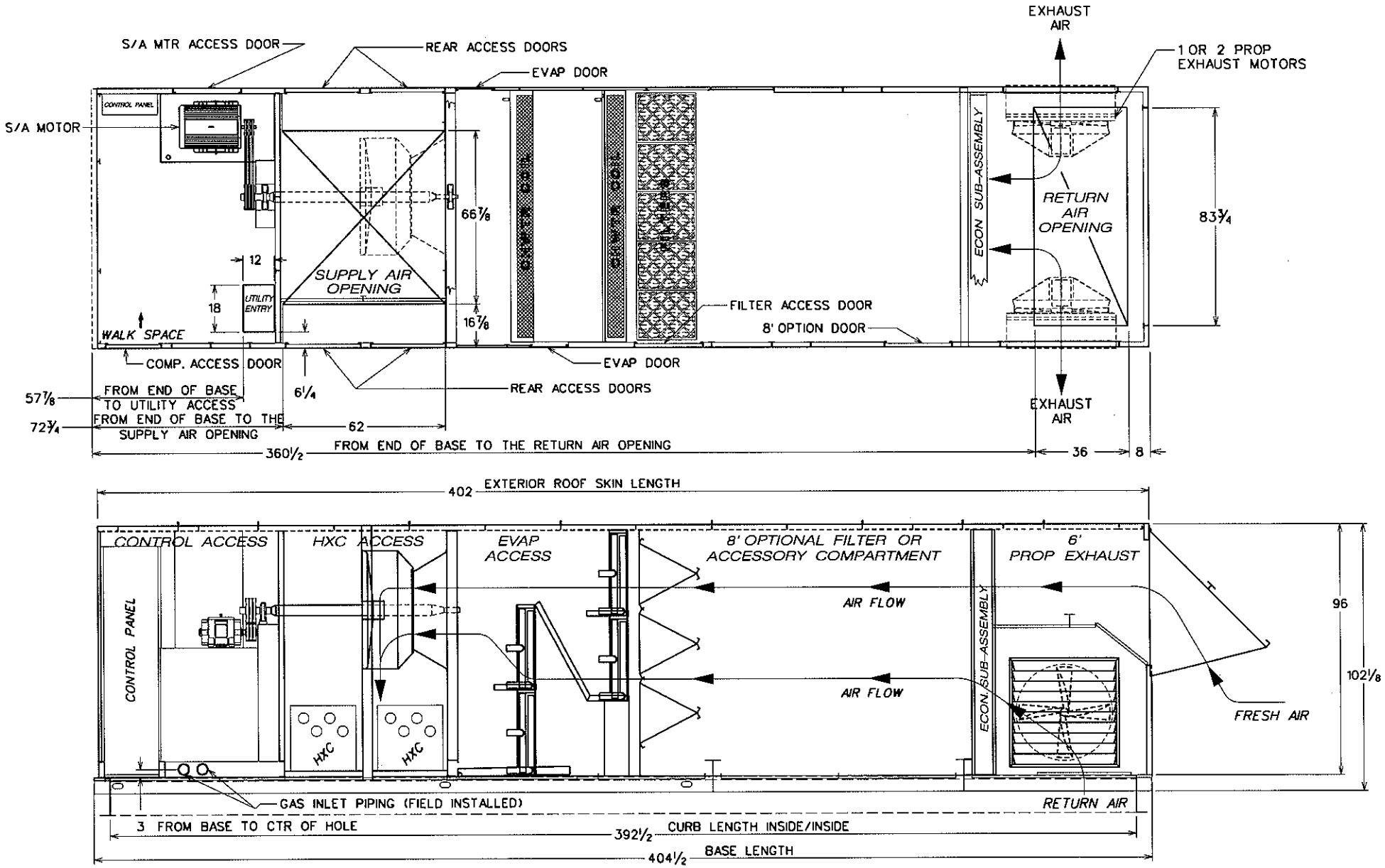
RF 40–130 TON AIR HNDLR W/10FT RETURN (12,000 – 24,000 HEAT WHEEL CFM)

(CONFIGURATION FOR 0 – 12,000 HEAT WHEEL CFM ON A32)



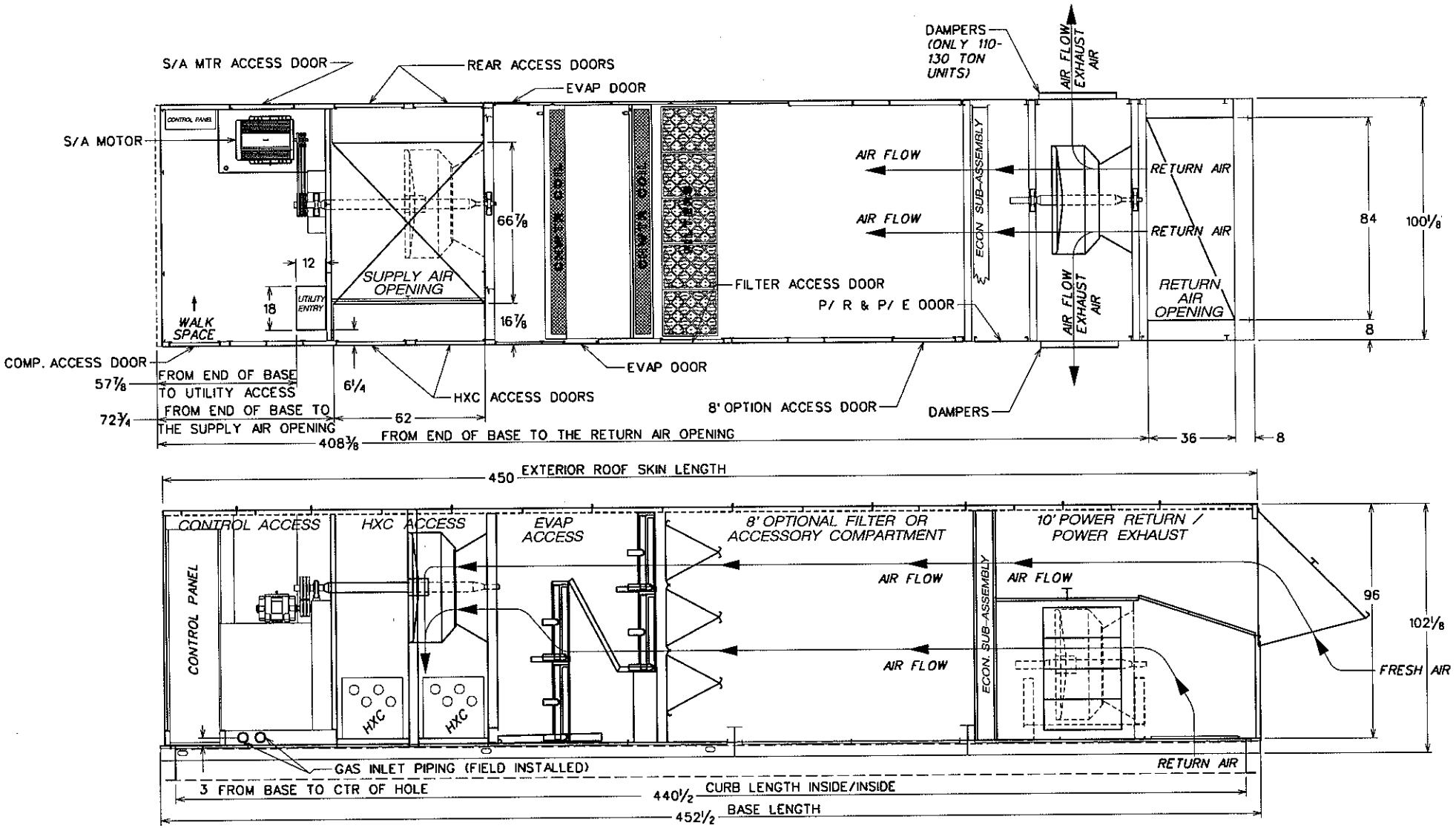
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–130 TON AIR HNDLR W/6FT RETURN AND 8FT OPTION



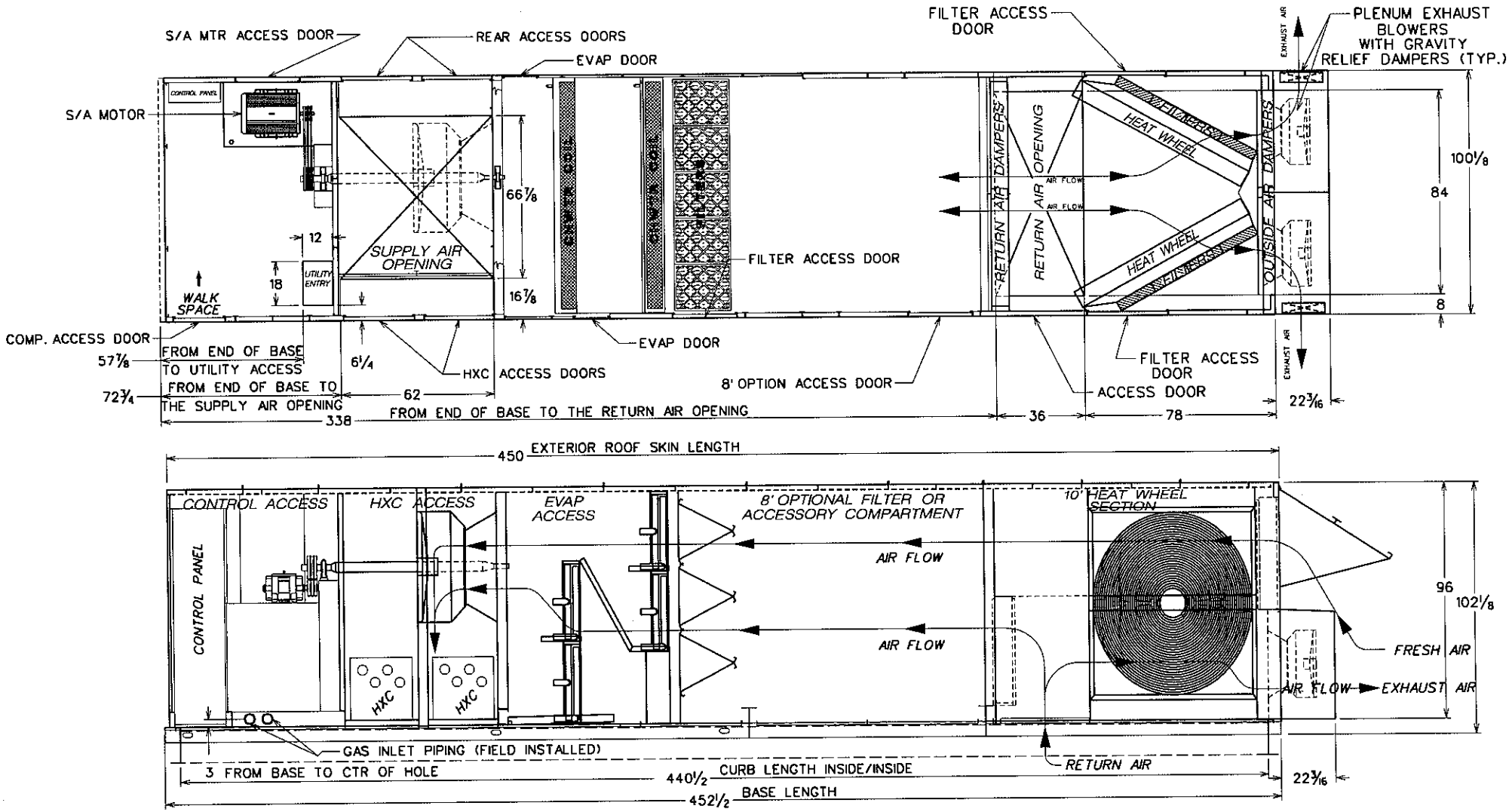
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–130 TON AIR HNDLR W/6FT PROP EXH. AND 8FT OPTION



NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–130 TON AIR HNDLR W/10FT RETURN AND 8FT OPTION



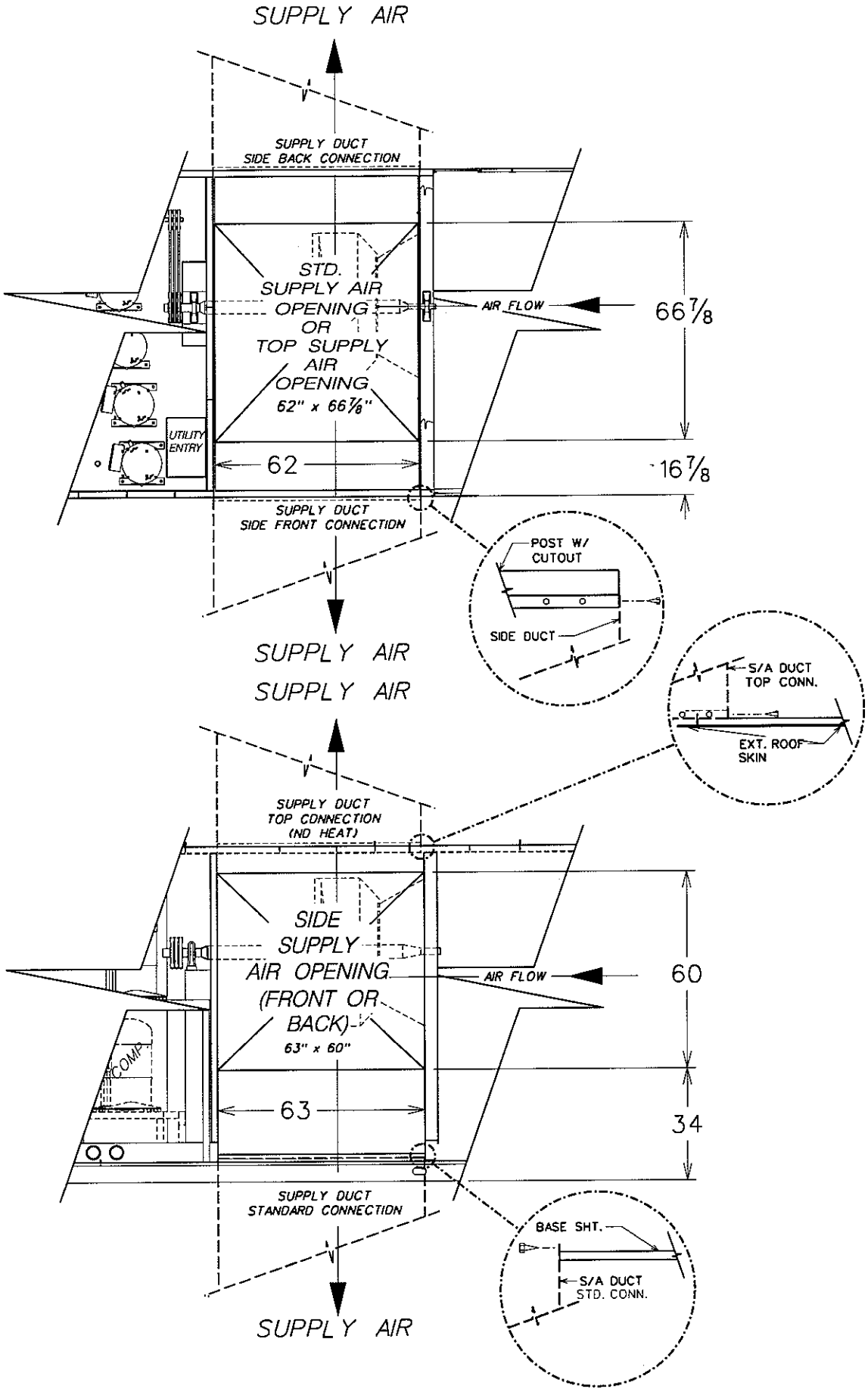
NOTE:
FOR SERVICEABILITY ALLOW A MINIMUM OF 100 INCHES, CLEARANCE AROUND UNIT.
FOR ADDITIONAL CURB DIMENSIONS SEE ALTERNATE CURB PAGE.

RF 40–130 TON AIR HNDLR W/10FT HEAT WHEEL AND 8FT OPTION (12,000 – 24,000 HEAT WHEEL CFM)

(CONFIGURATION FOR 0 – 12,000 HEAT WHEEL CFM ON A32)

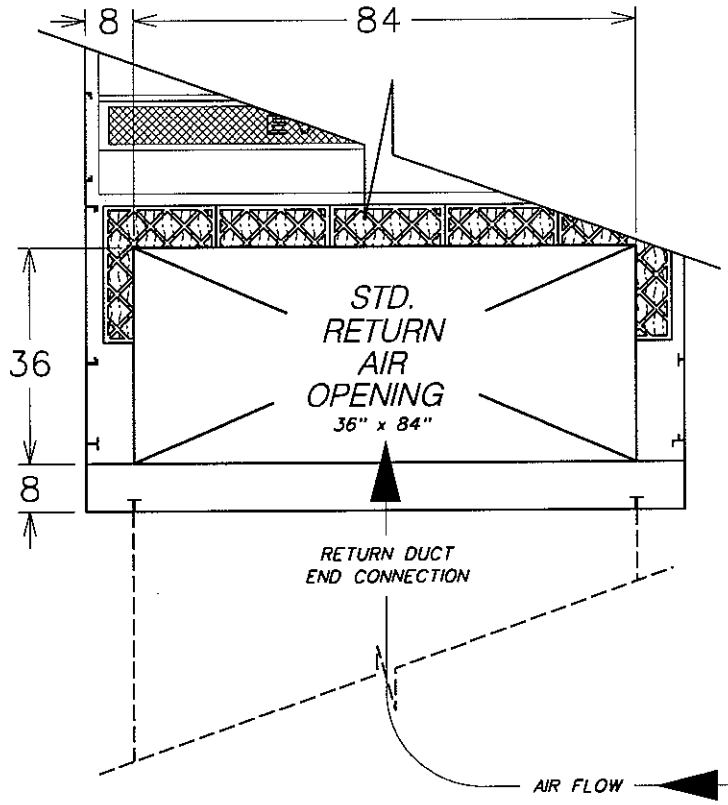
SUPPLY CONNECTIONS

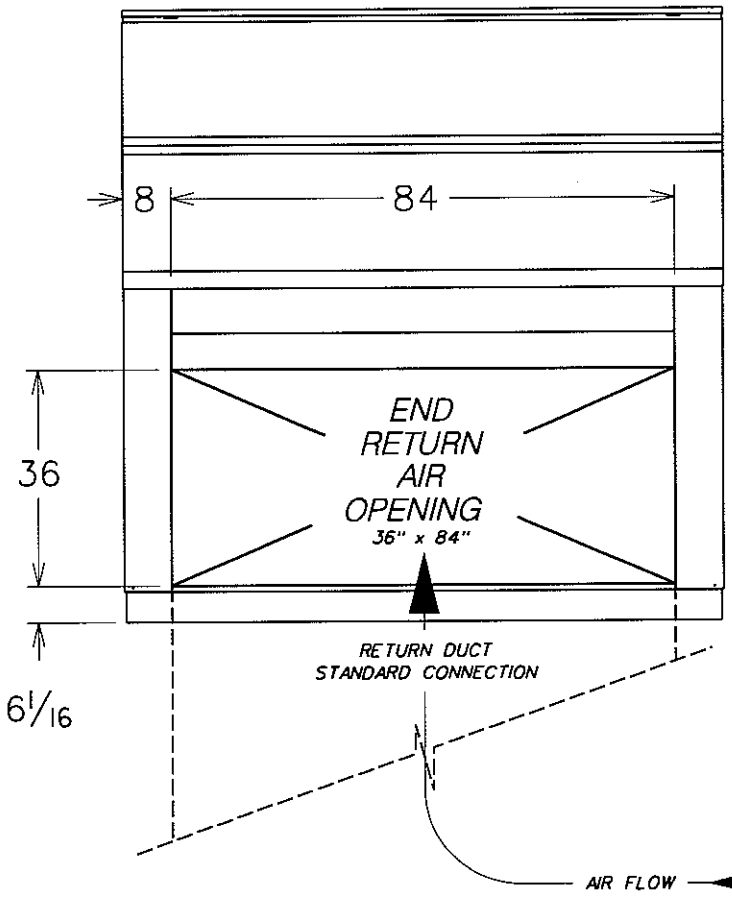
(ALTERNATE POSITIONS)



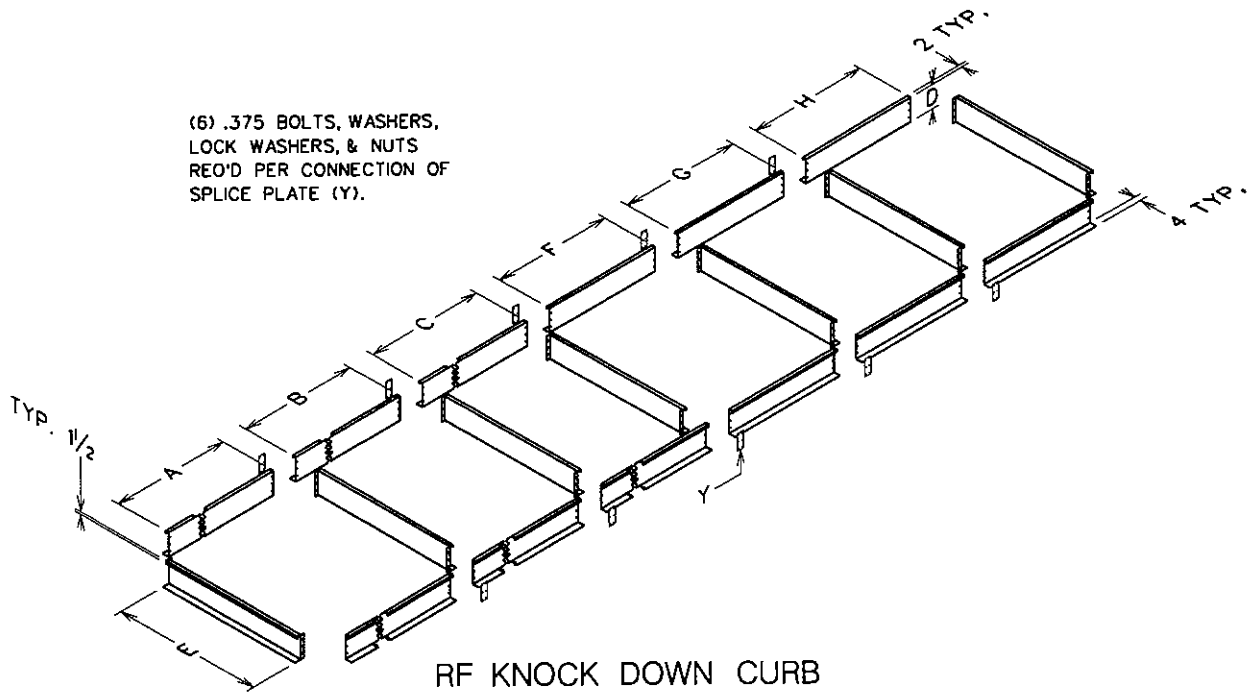
RETURN CONNECTIONS

(ALTERNATE POSITIONS)





RF CURBS

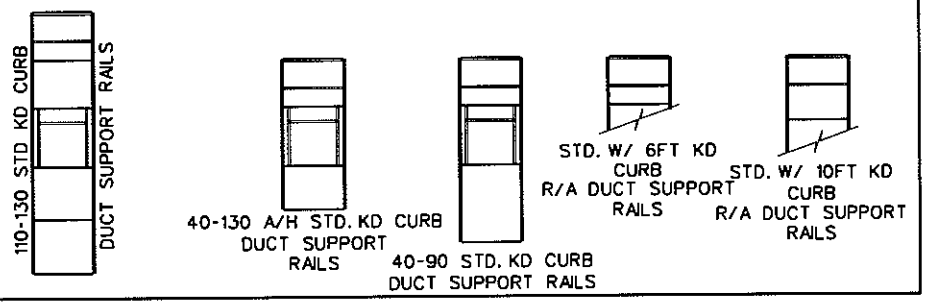


RF KNOCK DOWN CURB
EXPLODED VIEW

DIMENSIONS:

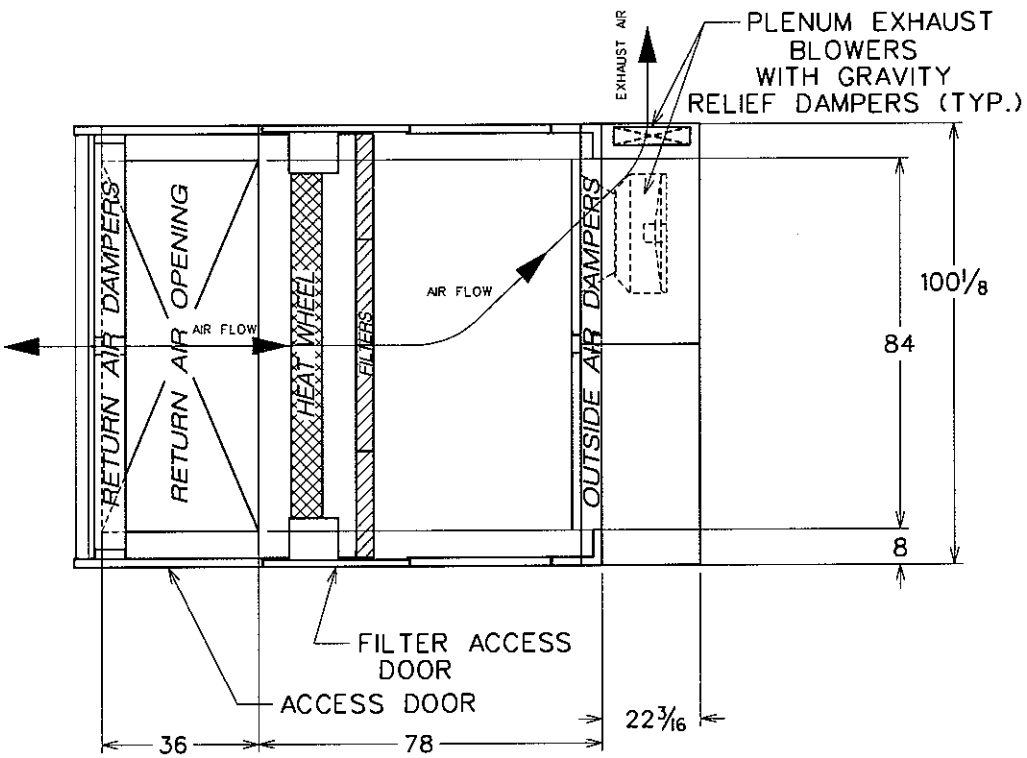
UNITS	CURB TYPE							
	KNOCK DOWN							
	A	B	C	D	E	F	G	H
AIR HANDLER (40-130)								
STD. (40-70 ONLY)	63 3/4	88 3/4	72	14/24	88			
WITH 6FT	63 3/4	88 3/4	72	14/24	88	72		
WITH 10FT	63 3/4	88 3/4	72	14/24	88	120		
WITH 6FT & 8FT OPT.	63 3/4	88 3/4	72	14/24	88	96	72	
WITH 10FT & 8FT OPT.	63 3/4	88 3/4	72	14/24	88	96	120	
(40-90)								
STD. (40-70 ONLY)	114 1/4	88 3/4	72	14/24	88			
WITH 6FT	114 1/4	88 3/4	72	14/24	88	72		
WITH 10FT	114 1/4	88 3/4	72	14/24	88	120		
WITH 6FT & 8FT OPT.	114 1/4	88 3/4	72	14/24	88	96	72	
WITH 10FT & 8FT OPT.	114 1/4	88 3/4	72	14/24	88	96	120	
(110-130)								
STD.	78 5/8	78 5/8	88 3/4	14/24	88	72	72	
WITH 10FT	78 5/8	78 5/8	88 3/4	14/24	88	72	120	
WITH 6FT & 8FT OPT.	78 5/8	78 5/8	88 3/4	14/24	88	72	96	72
WITH 10FT & 8FT OPT.	78 5/8	78 5/8	88 3/4	14/24	88	72	96	120

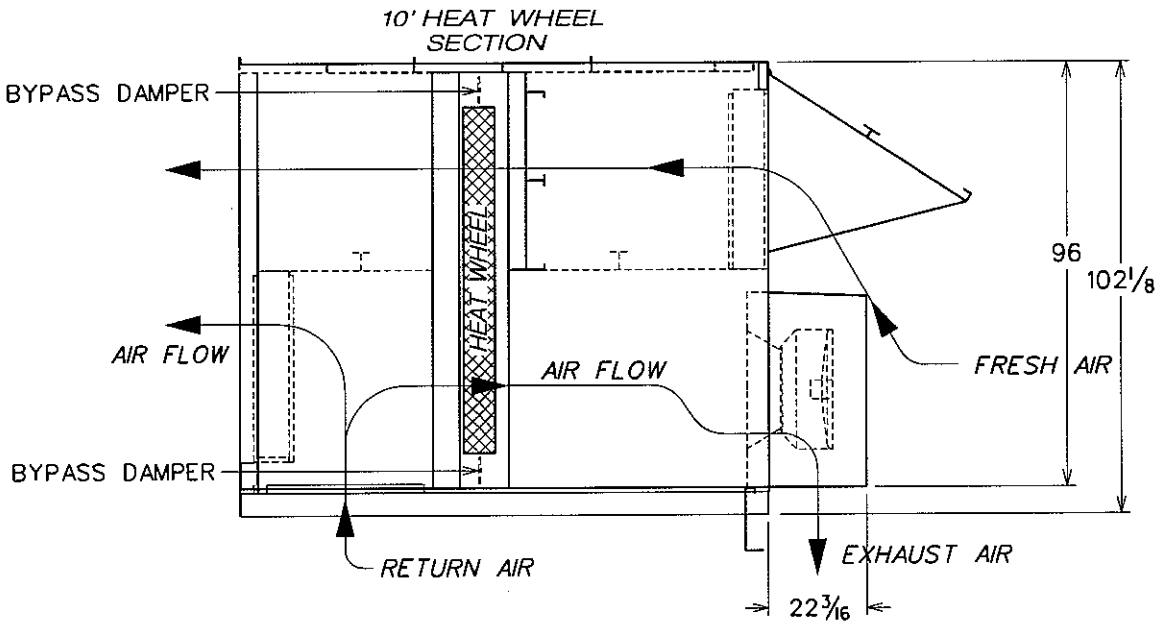
NOTE:
THIS IS A DETAIL OF THE KNOCK DOWN CURBS W/ DUCT SUPPORT RAILS. THESE DUCT SUPPORT RAILS ARE OPTIONAL AND NEED TO BE ORDERED BY A KIT NUMBER.



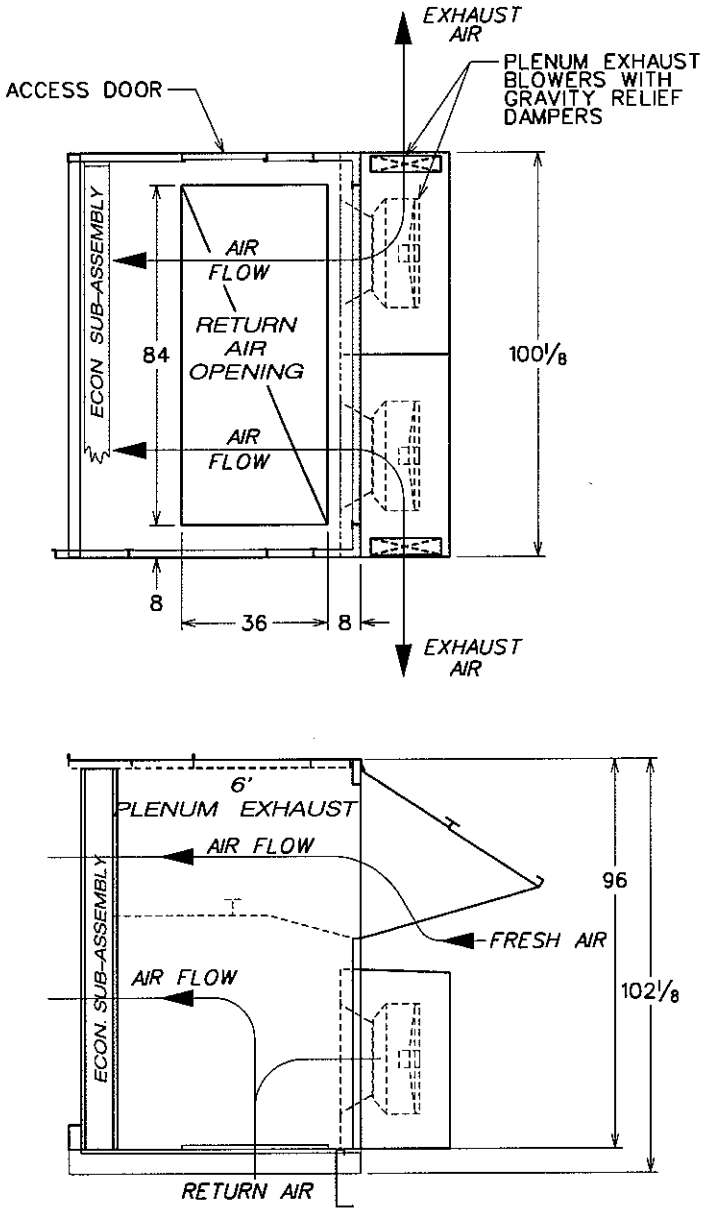
NOTE: ALL DIMENSIONS ARE INSIDE TO INSIDE UNLESS SHOWN OTHERWISE.
NOTE: FOR OVERALL LENGTH OF CURB SEE THE INDIVIDUAL DRAWINGS.

ALTERNATE HEAT WHEEL CONFIGURATION (0 – 12,000 HEAT WHEEL CFM)





PLENUM EXHAUST CONFIGURATION

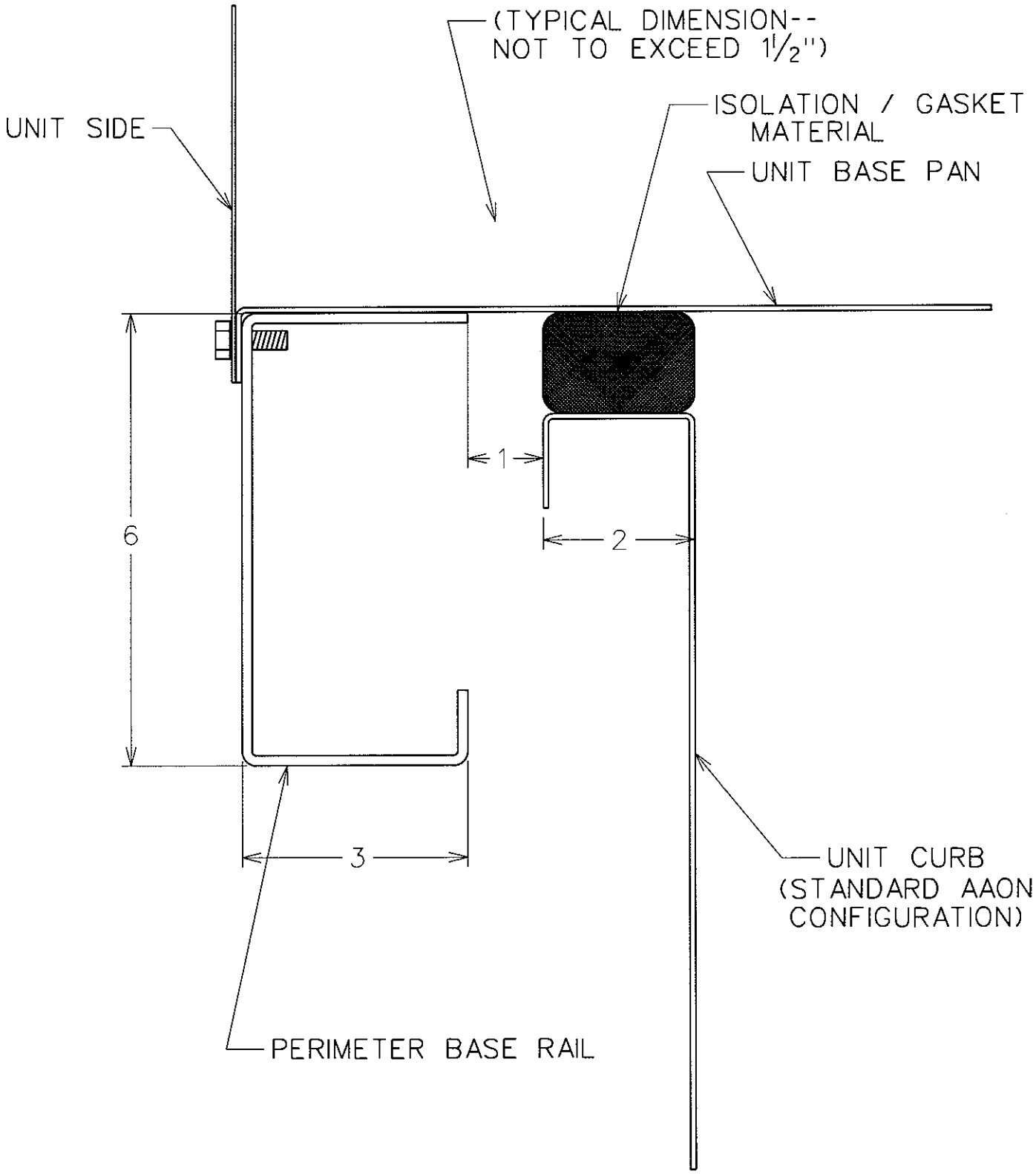


FEATURE 1

OPTION "S" - PLENUM EXHAUST - TWO FANS - W/ FULL MOD ECON

SEE FEATURE 13 FOR MOTOR OPTIONS

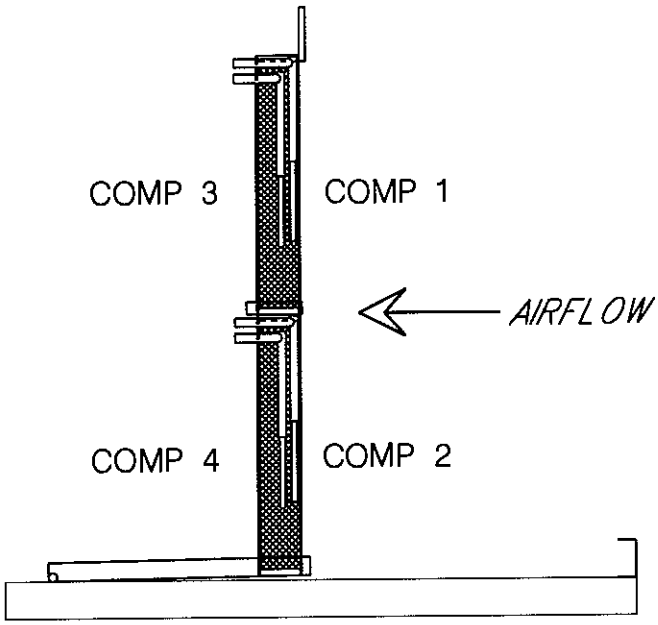
RF BASE DETAIL



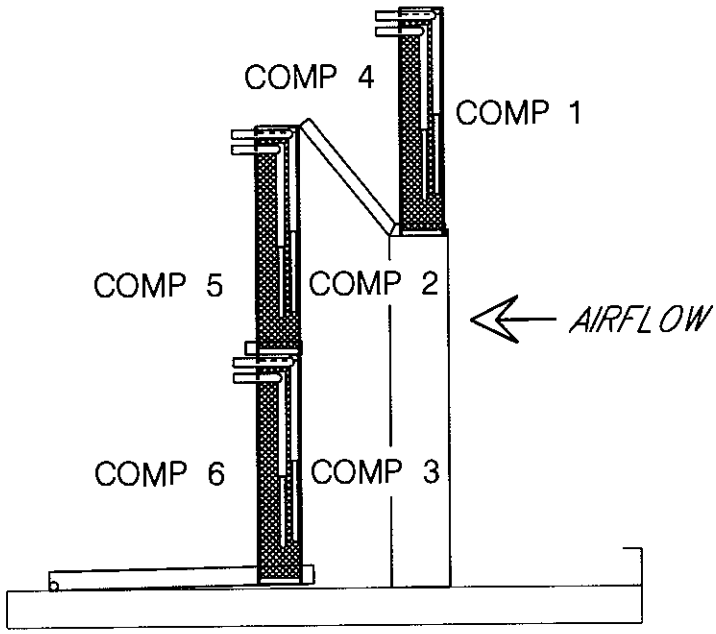
RF DX COIL CONFIGURATION

– ENGR. NOTE: CHILLED WATER COILS CONFIGURED IN SAME MANNER AS DX COOLING COILS

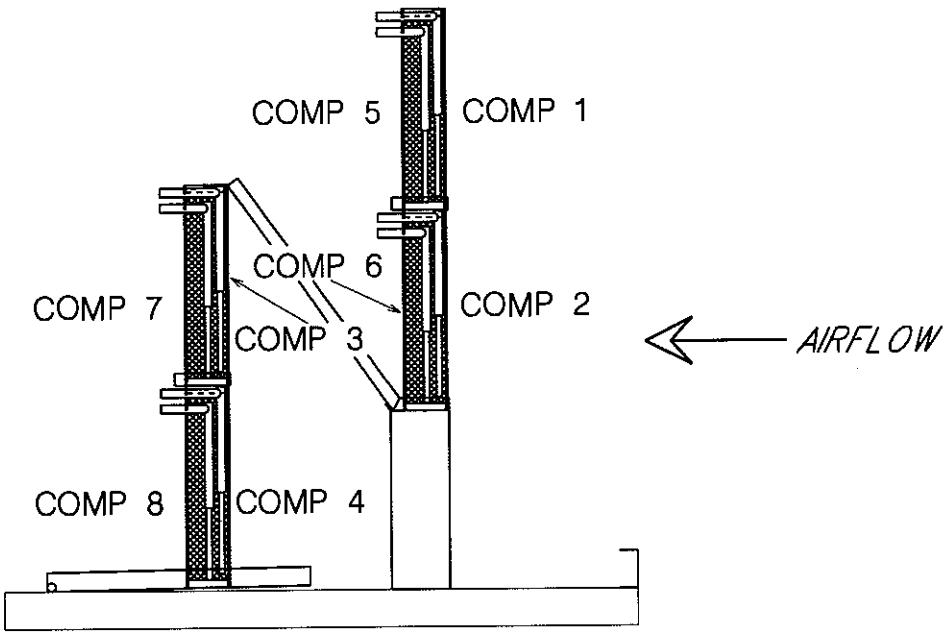
40 thru 70 TON

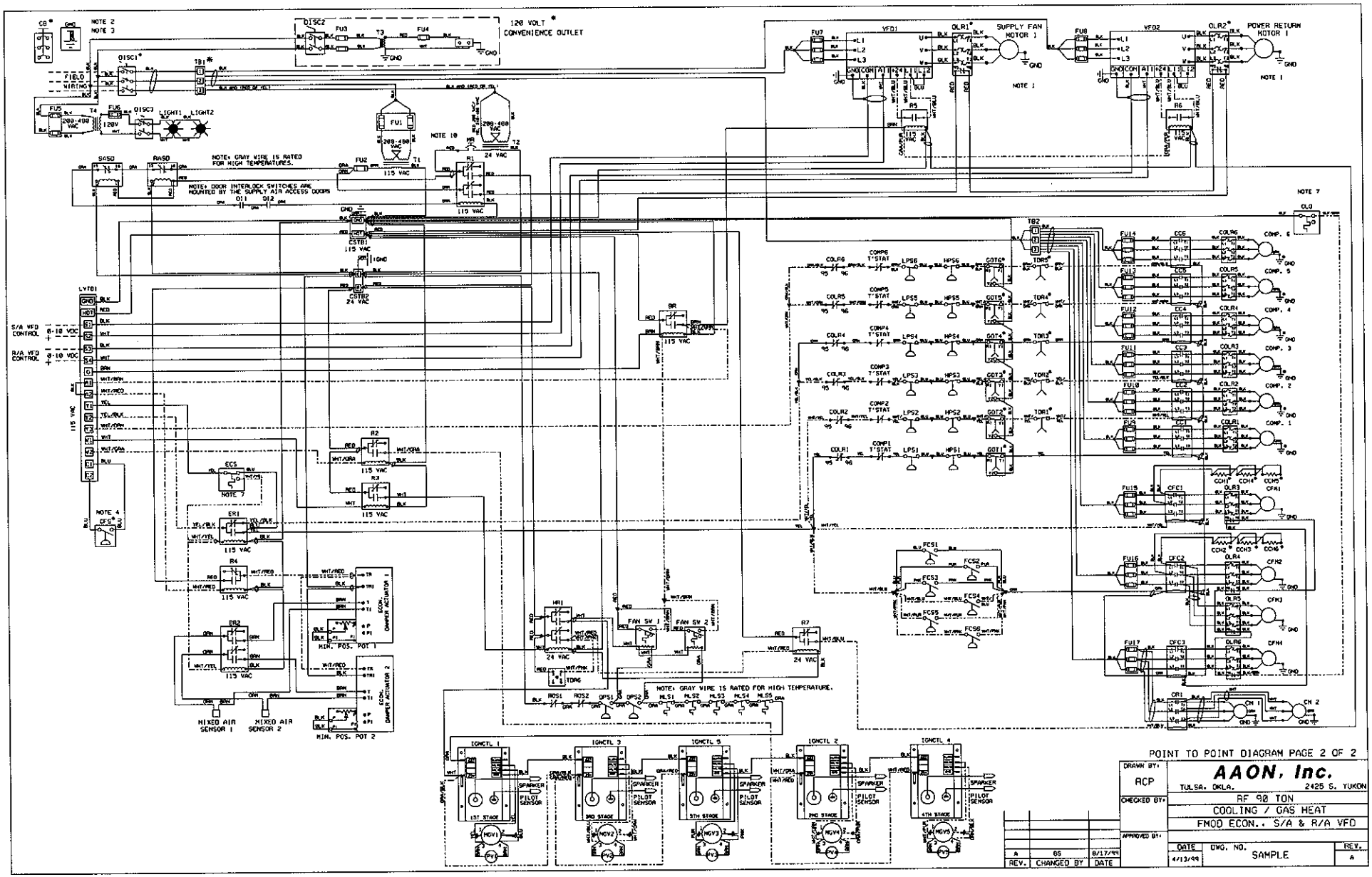


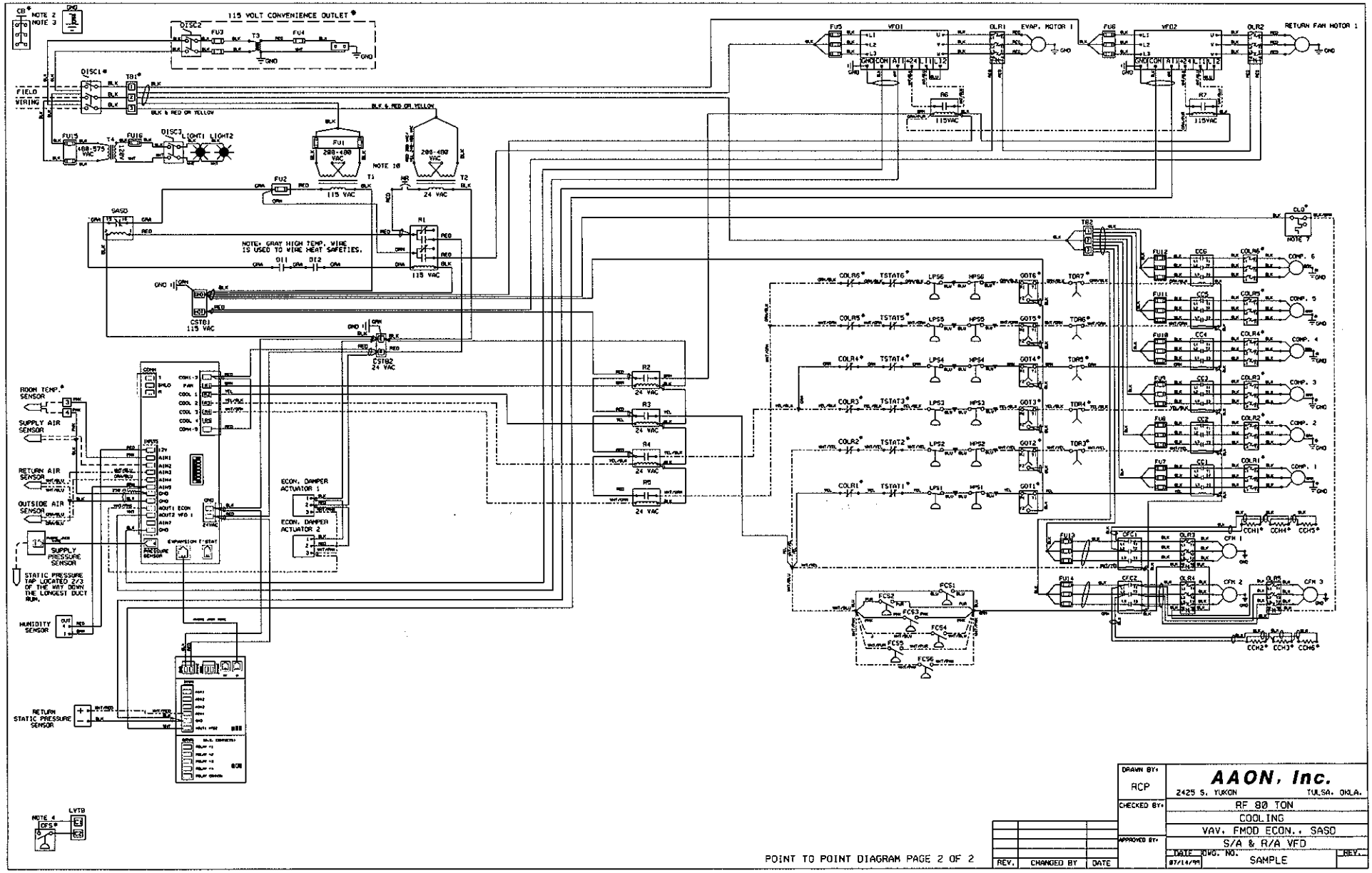
80/90 TON

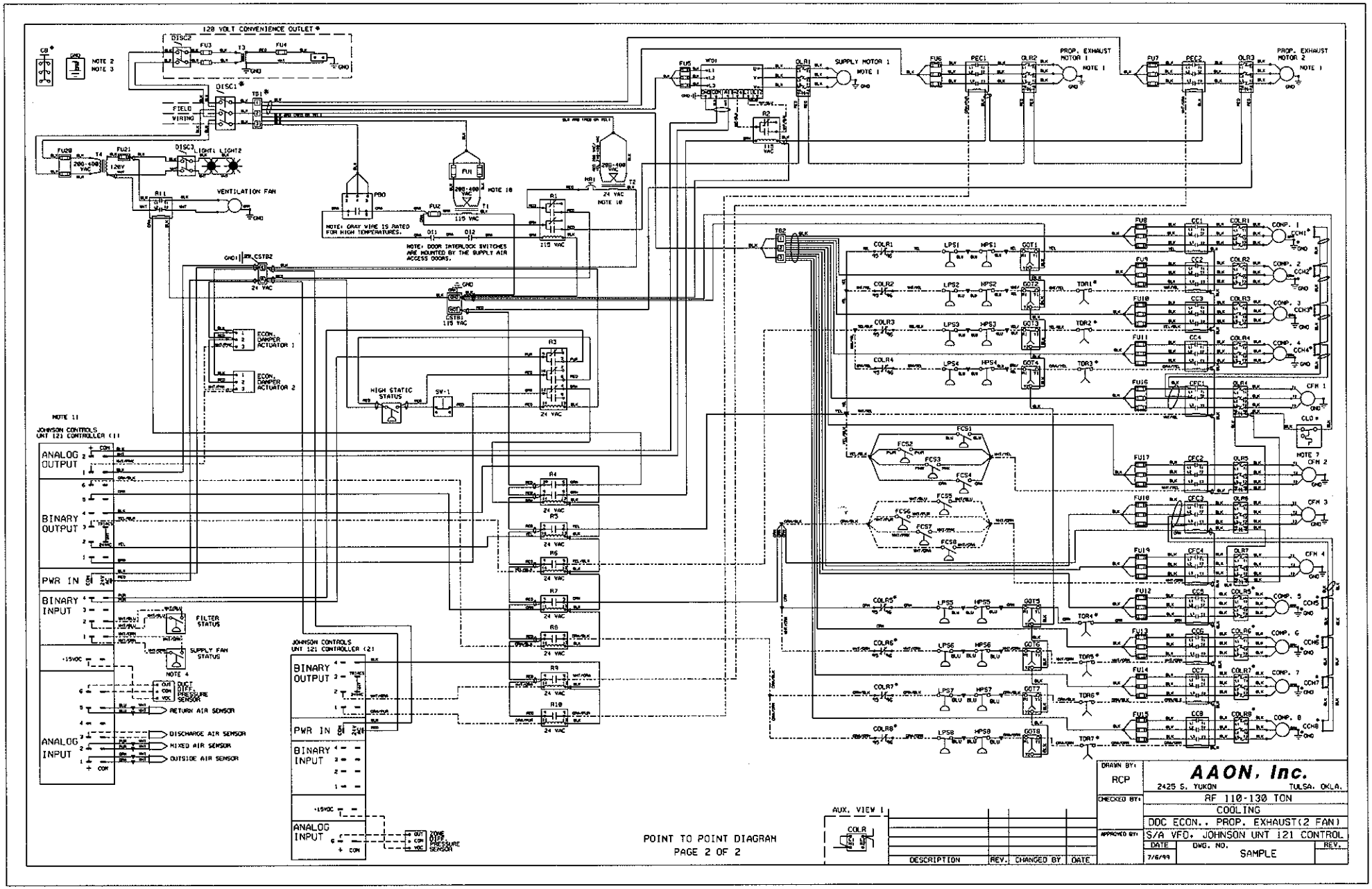


110/120/130 TON




POINT TO POINT DIAGRAM PAGE 2 OF 2
AAON, Inc.
TULSA, OKLA. 2425 S. YUKON
RF 90 TON
COOLING / GAS HEAT
FMOD ECON., S/A & R/A VFD
DRAWN BY: RCP
CHECKED BY:
APPROVED BY:
DATE 4/13/99
DWG. NO. SAMPLE
REV. A
A 6S 8/17/99
REV. CHANGED BY DATE
120 VOLT CONVENIENCE OUTLET
SUPPLY FAN MOTOR 1
POWER RETURN MOTOR 1
NOTE: GRAY WIRE IS RATED FOR HIGH TEMPERATURES.
NOTE: DOOR INTERLOCK SWITCHES ARE MOUNTED BY THE SUPPLY AIR ACCESS DOORS
S/A VFD CONTROL 0-10 VDC
R/A VFD CONTROL 0-10 VDC
MIXED AIR SENSOR 1
MIXED AIR SENSOR 2
MIN. POS. POT 1
MIN. POS. POT 2
1ST STAGE
2ND STAGE
3RD STAGE
4TH STAGE
5TH STAGE


115 VOLT CONVENIENCE OUTLET
EVAP. MOTOR 1
RETURN FAN MOTOR 1
FIELD WIRING
NOTE: GRAY HIGH TEMP. WIRE IS USED TO WIRE HEAT SAFETIES.
ROOM TEMP.
SUPPLY AIR SENSOR
RETURN AIR SENSOR
OUTSIDE AIR SENSOR
SUPPLY PRESSURE SENSOR
STATIC PRESSURE TAP LOCATED 2/3 OF THE WAY DOWN THE LONGEST DUCT RUN.
HUMIDITY SENSOR
RETURN STATIC PRESSURE SENSOR
ECON. DAMPER ACTUATOR 1
ECON. DAMPER ACTUATOR 2
EXPANSION T'STAT
POINT TO POINT DIAGRAM PAGE 2 OF 2
DRAWN BY: RCP
CHECKED BY:
APPROVED BY:
AAON, Inc.
2425 S. YUKON TULSA, OKLA.
RF 80 TON
COOLING
VAV, FMOD ECON., SASD
S/A & R/A VFD
DATE 07/14/99
DWG. NO. SAMPLE
REV.
REV. CHANGED BY DATE



DRAWN BY:	RCP
CHECKED BY:	
APPROVED BY:	
DATE	7/6/99
DWG. NO.	SAMPLE
REV.	

AAON, Inc.
2425 S. YUKON TULSA, OKLA.
RF 110-130 TON
COOLING
DDC ECON., PROP. EXHAUST(2 FAN)
S/A VFD, JOHNSON UNT 121 CONTROL

*NOTE: DIAGRAM SHOWN WITH CUSTOMER FURNISHED JOHNSON CONTROLS

AAON
INCORPORATED

2425 South Yukon
Tulsa, Oklahoma 74107
Ph: (918) 583-2266
Fax: (918) 583-6094

P83720 • RF 40 - 130 • REV. 9-99