Number One Air Conditioning Maker

Carrier

Division of Carrier Corporation

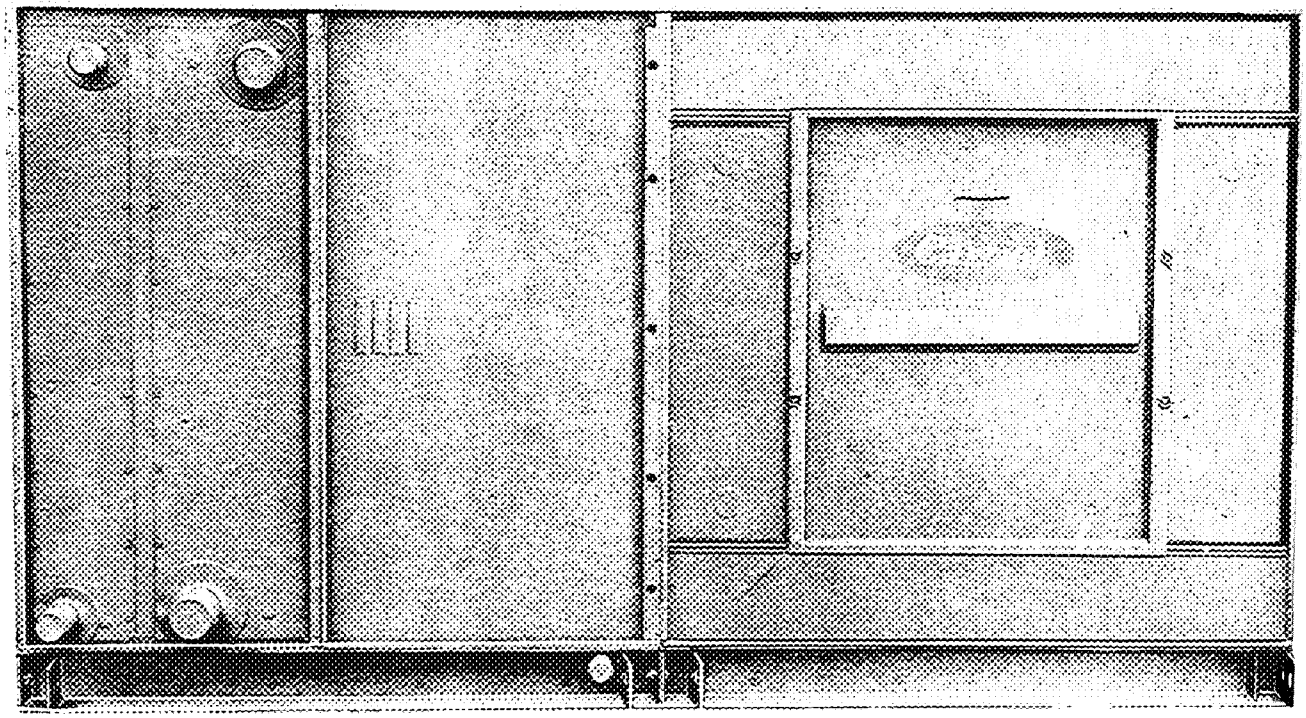
Carrier Parkway • Syracuse N.Y. 13221

Advance Product Data 38AC/39E

CARRIER

MODULAR CENTRAL STATION
HEAT PUMP SYSTEMS

3000 - 20,000 CFM
10 - 40 TONS CAPACITY



- APPLICATION FLEXIBILITY
- PROVEN 38AC/39E PRODUCT PERFORMANCE
- 7 DOLLAR-SAVING SIZES

Book	1
Tab	5a

4/78 PC 111 Form 38AC-1APD New

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TABLE OF CONTENTS

INTRODUCTION

CARRIER AGAIN LEADS THE WAY IN HEAT PUMP TECHNOLOGY WITH A NEW LINE OF HEAT PUMP COILS INTENDED FOR USE WITHIN THE 39ED,F.P. MODULAR UNIT. CAPACITIES FROM 10 THRU 40 TONS NOMINAL COOLING ARE AVAILABLE AT THIS TIME.

THESE UNITS COMBINE THE PROVEN PRODUCT RELIABILITY OF THE 38AC012 AND 38AC016 OUTDOOR HEAT PUMP SECTIONS WITH THE FLEXIBILITY OF THE 39E CENTRAL STATION AIR HANDLER.

ALL ACCESSORIES REGULARLY OFFERED AS PART OF THE 39E MODULAR SYSTEM IN THE HORIZONTAL AND VERTICAL DRAW THROUGH FAN ARRANGEMENTS ARE COMPATIBLE FOR USE WITH THESE HEAT PUMP VERSIONS - REFERENCE THE LIMITATIONS IN THE ENCLOSED APPLICATION DATA.

ALL "HEAT PUMP" REFRIGERANT ACCESSORIES.....
CHECK VALVES, EXPANSION VALVES, FILTER DRIERS AND NOZZLES ARE PROVIDED BY THE FACTORY AND SHIPPED WITH THE 39E COIL. THE FILTER DRIERS AND EXPANSION VALVES ARE TO BE INSTALLED ON THE JOB. SEE REFRIGERANT PIPING DATA.

ALL COILS WILL OFFER THE STANDARD SLIDE OUT CARTRIDGE FEATURE - 6 ROW 8 FINS PER INCH CU OR AL FIN.

SYSTEMS INDEX

SYSTEM NO.	39E FAN SIZE	38AC 012	38AC 016	NOMINAL COOLING CAPACITY (TONS)	APPROVED CFM RANGE
1	08	1	-	10	3,000-5,000
2	12	-	1	15	4,500-7,500
3	15	2	-	20	6,000-10,000
4	18	1	1	25	8,000-12,000
5	21	-	2	30	9,000-14,000
6	26	2	1	35	11,000-18,000
7	32	1	2	40	12,000-20,000

SYSTEM COMPONENTS

SYSTEM NO.	1	2	3	4	5	6	7
Multiunit Control Package	NR	NR	A	A	A	A	A
Resistance Heaters w/Control Box	A	A	A	A	A	A	A
Outdoor Thermostat	A	A	A	A	A	A	A
Thermostat and Subbase	A	A	A	A	A	A	A
Emergency Heat Relay	A	A	A	A	A	A	A
Indoor Fan Motor Relay	A	A	A	A	A	A	A
Indoor Fan Motor Contactor	FS	FS	FS	FS	FS	FS	FS
Strip Heat Control Relay	A	A	A	A	A	A	A

A - ACCESSORY AVAILABLE

FS - FIELD SUPPLIED

NR - NOT REQUIRED

SYSTEM ACCESSORIES

MULTIUNIT CONTROL PACKAGE - (40RR900101) - A RELAY ASSEMBLY THAT ISOLATES THE LOW VOLTAGE CONTROL CIRCUITS OF EACH 38AC OUTDOOR SECTION. REQUIRED FOR MULTIPLE 38AC INSTALLATIONS.

RESISTANCE HEATERS - ACCESSORY TO STANDARD 39E. CONSULT 39E-5P FOR PRESSURE DROPS AND CAPACITIES. STEP CONTROLLERS NOT REQUIRED - STAGING DONE BY OA STATS.

OUTDOOR THERMOSTAT(S) - (HH229A050) - PERMITS STAGING OF ELECTRIC HEAT IN RESPONSE TO OA TEMPERATURE DROP.

THERMOSTAT AND SUBBASE ASSEMBLY - FOR EMERGENCY HEAT AND NON-EMERGENCY HEAT APPLICATIONS. REFERENCE CONTROL SECTION FOR RECOMMENDATIONS.

EMERGENCY HEAT RELAY - (HN65DZ024)- LOCKS OUT COMPRESSORS AND JUMPERS OA STATS WHEN EMERGENCY ELECTRIC HEAT IS SWITCHED ON.

INDOOR FAN MOTOR RELAY - (38GC900152) - REQUIRED TO CONTROL INDOOR FAN CONTACTOR.

STRIP HEAT CONTROL RELAY - (38GC900152) - REQUIRED TO ISOLATE THE 38AC LOW VOLTAGE CIRCUIT FROM THE 39E LOW VOLTAGE CIRCUIT. THE 38GC900152 IS A FAN RELAY, BUT CAN BE USED TO ISOLATE THE CIRCUITS.

39ED,ER PHYSICAL DATA

SYSTEM NO.	1	2	3		4		5		6			7		
39E SIZE	08	12	15		18		21		26			32		
CFM Range	3000-5000	4500-7500	6000-10000		8000-12000		9000-14000		11000-18000			12000-20000		
Motor Frame Min.	145T 2	145T 2	145T 2		182T 3		182T 3		184T 5			184T 5		
Size, HP Max.	213T 7.5	215T 10	254T 15		254T 15		256T 20		284T 25			286T 30		
Tot. Coil Face Area	7.78	11.5	14.8		17.3		20.4		26.3			31.9		
			Air Delivery CFM											
Coil Face Velocity (FPM) 400	3112	4600	5920		6920		8160		10520			12760		
500	3890	5750	7400		8650		10200		13150			15950		
600	4668	6900	8880		10380		12240		15780			19140		
700	5446	8050	10360		12110		14280		18410			22330		
Coil			U	L	U	L	U	L	U	M	L	U	M	L
Coil Split (Tubes In Face)	No Split	No Split	12	12	16	12	14	14	10	16	10	14	8	14
Refrigerant	500	22	500	500	22	500	22	22	500	22	500	22	500	22
Outdoor Unit 38AC	012	016	012	012	016	012	016	016	012	016	012	016	012	016
Face Area	7.78	11.5	7.4	7.4	9.88	7.41	10.2	10.2	7.31	11.68	7.31	12.41	7.08	12.41
Vapor Conn.	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Liquid Conn.	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8	5/8

NOTES: 1. HEAT PUMP COIL DIMENSIONS, WEIGHTS, AND AIR PRESSURE DROPS AS PER 39E-5P, 6 ROW-8 FIN PER INCH - DRAW THRU NON-BYPASS COOLING COIL.

2. MAXIMUM MOTOR FRAME SIZES BASED ON ODP. (1800 RPM). (Based on FC fan)

3. U, M, L - UPPER, MIDDLE, LOWER COIL DESIGNATION REFLECT RIGHT OR LEFT HAND CONNECTION WITH EXCEPTION OF SYSTEM NO. 4 WHICH AS SHOWN IS RIGHT HAND ONLY. LEFT HAND CONNECTIONS ON SYSTEM NO. 4 - 016 ON L, 012 ON U.

1

38ACQ12/39EDQ8

TEMP (F) AIR ENT OUTDOOR UNIT		AIR ENT 39E COIL - CFM/BF								
		3000/.053			4000/.079			5000/.159		
		TEMP AIR ENT 39E INDOOR COIL (WB)								
		72	67	62	72	67	62	72	67	62
85	TC	135	125	115	140	131	122	143	134	128
	SHC	68	85	101	75	97	117	82	108	128
	KW	12.9	12.4	11.9	13.2	12.7	12.3	13.3	12.9	12.6
95	TC	129	120	110	133	125	117	136	128	122
	SHC	66	83	99	73	95	114	79	106	122
	KW	13.6	13.1	12.6	13.9	13.4	12.9	14.0	13.6	13.3
100	TC	125	117	108	130	121	114	132	125	120
	SHC	64	81	98	71	93	112	78	104	120
	KW	13.9	13.4	12.9	14.2	13.7	13.2	14.3	13.9	13.6
105	TC	122	113	105	126	118	111	129	121	117
	SHC	63	80	96	70	92	110	76	103	117
	KW	14.2	13.7	13.1	14.5	14.0	13.5	14.6	14.2	13.9
115	TC	116	108	100	119	112	106	121	114	111
	SHC	60	78	94	67	89	106	73	100	111
	KW	14.9	14.3	13.7	15.1	14.6	14.2	15.3	14.8	14.6

NOTES

Direct interpolation is permissible. Do not extrapolate.

SHC is based on 80 F db air entering indoor coil.
Below 80 F db, subtract (Corr Factor x Cfm) from SHC.
Above 80 F db add (Corr Factor x Cfm) to SHC.

	ENTERING AIR DRY BULB TEMP (F)					
BYPASS FACTOR	79	78	77	76	75	under 75
	.81	.82	.83	.84	.85	over .85
	Correction Factor					
.05	1.04	2.07	3.11	4.14	5.18	Use formula shown below.
.10	.98	1.96	2.94	3.92	4.90	
.20	.87	1.74	2.62	3.49	4.36	
.30	.76	1.53	2.29	3.05	3.82	
.35	.71	1.42	2.13	2.83	3.54	

Interpolation is permissible.

Correction Factor = 1.09 x (1 - BF) x (db - 80)

Capacities are based on 25 actual ft (40 equivalent ft) of interconnecting piping, sized to the outdoor unit field connections. For other equivalent lengths refer to the Carrier System Design Manual, Part 3 for line losses.

2

38AC016/39ED012

TEMP (F) AIR ENT OUTDOOR UNIT		AIR ENT 39E COIL - CFM/RF								
		4500/.078			6000/.085			7500/.101		
		TEMP AIR ENT 39E INDOOR COIL (WB)								
		72	67	62	72	67	62	72	67	62
85	TC	194	180	167	200	187	176	204	192	184
	SHC	99	124	149	109	143	172	119	160	184
	KW	17.6	17.0	16.4	17.9	17.4	16.9	18.1	17.6	17.2
95	TC	185	172	159	191	179	168	195	183	176
	SHC	95	121	145	106	139	167	116	156	176
	KW	18.9	18.2	17.6	19.1	18.5	18.0	19.3	18.7	18.4
100	TC	180	168	155	186	174	164	190	179	173
	SHC	94	119	144	104	138	164	114	154	173
	KW	19.5	18.8	18.1	19.8	19.1	18.6	20.0	19.3	19.0
105	TC	176	164	152	181	170	160	184	174	169
	SHC	92	118	142	103	135	160	112	152	169
	KW	20.1	19.4	18.7	20.4	19.7	19.2	20.5	19.9	19.7
115	TC	---	155	144	---	---	153	---	---	---
	SHC	---	114	137	---	---	153	---	---	---
	KW	---	20.5	19.8	---	---	20.4	---	---	---

3

38AC012-W/U, 38AC012 W/L OF 39ED15

TEMP (F) AIR ENT OUTDOOR UNIT		AIR ENT 39E COIL - CFM/BF								
		6000/.047			8000/.078			10,000/.082		
		TEMP AIR ENT 39E INDOOR COIL (WB)								
		72	67	62	72	67	62	72	67	62
85	TC	264	244	224	275	255	238	281	262	250
	SHC	134	168	200	149	192	231	163	215	250
	KW	25.4	24.4	23.4	25.9	24.9	24.1	26.2	25.2	24.7
95	TC	252	233	215	261	243	227	268	250	240
	SHC	129	163	195	144	188	225	158	210	240
	KW	26.8	25.7	24.6	27.3	26.2	25.3	27.6	26.6	26.0
100	TC	246	227	210	255	237	222	260	243	234
	SHC	127	161	192	142	185	221	156	208	234
	KW	27.4	26.3	25.2	27.9	26.9	26	28.3	27.2	26.7
105	TC	239	222	205	248	231	217	253	237	229
	SHC	125	158	190	140	183	217	153	205	229
	KW	28.0	26.9	25.8	28.6	27.4	26.5	28.9	27.8	27.5
115	TC	227	210	194	234	218	207	239	224	218
	SHC	120	153	185	135	178	207	148	199	218
	KW	29.3	28.0	26.9	29.8	28.6	27.8	30.1	29.0	28.6

4

38AC016-W/U, 38AC012 W/L OF 39ED18

TEMP (F) AIR ENT OUTDOOR UNIT		AIR ENT 39E COIL - CFM/BF								
		8000/.076			10,000/.084			12000/.090		
		TEMP AIR ENT 39E INDOOR COIL (WB)								
		72	67	62	72	67	62	72	67	62
85	TC	323	301	278	333	310	290	339	317	302
	SHC	167	212	255	182	236	284	196	259	302
	KW	30.3	29.3	28.2	30.7	29.7	28.8	31.0	30.0	29.3
95	TC	309	287	266	317	296	278	323	302	289
	SHC	162	206	249	176	231	275	190	253	289
	KW	32.2	31.0	29.9	32.6	31.5	30.5	32.9	31.8	31.1
100	TC	301	280	260	309	288	271	314	294	283
	SHC	159	204	245	173	227	270	187	249	283
	KW	33.1	31.9	30.7	33.5	32.4	31.4	33.8	32.7	32.0
105	TC	293	273	253	301	281	265	305	286	277
	SHC	156	201	242	170	224	265	184	246	277
	KW	34.0	32.7	31.6	34.4	33.2	32.3	34.7	33.6	33.0
115	TC	277	258	240	284	266	253	288	271	263
	SHC	150	195	235	164	218	253	178	239	263
	KW	35.8	34.4	33.2	36.2	35.0	34.1	36.5	35.3	34.8

5

38ACO16-W/U, 38ACO16 W/L OF 39ED21

TEMP (F) AIR ENT OUTDOOR UNIT		AIR ENT 39E COIL - CFM/BF								
		9000/.053			12000/.079			14000/.123		
		TEMP AIR ENT 39E INDOOR COIL (WB)								
		72	67	62	72	67	62	72	67	62
85	TC	378	352	327	391	366	344	397	372	354
	SHC	193	244	293	214	279	336	227	301	354
	KW	34.8	33.6	32.5	35.4	34.2	33.3	35.6	34.5	33.7
95	TC	362	337	313	374	350	330	378	356	341
	SHC	187	237	286	208	273	326	220	294	341
	KW	37.1	35.9	34.7	37.7	36.5	35.5	38.0	36.8	36.1
100	TC	353	329	306	364	341	322	369	347	333
	SHC	184	234	282	204	269	321	217	290	333
	KW	38.3	37.0	35.8	38.9	37.7	36.7	39.2	38.0	37.2
105	TC	344	321	298	355	332	315	359	338	325
	SHC	180	231	278	201	265	315	213	286	325
	KW	39.5	38.2	36.8	40.1	38.8	37.8	40.3	39.1	38.4
115	TC	325	304	283	---	314	300	---	319	310
	SHC	173	223	270	---	257	300	---	277	310
	KW	41.8	40.4	39.1	---	41.1	40.2	---	41.4	40.8

6

38ACO12-W/U, 38ACO16 W/M, 38ACO12 W/L OF 39ED26

TEMP (F) AIR ENT OUTDOOR UNIT		AIR ENT 39E COIL - CFM/BF								
		11,000/.051			14,000/.082			18,000/.105		
		TEMP AIR ENT 39E INDOOR COIL (WB)								
		72	67	62	72	67	62	72	67	62
85	TC	464	431	399	478	447	418	489	459	438
	SHC	237	299	358	258	336	405	285	379	438
	KW	43.5	41.9	40.4	44.2	42.7	41.3	44.7	43.3	42.3
95	TC	443	412	382	456	426	400	466	438	421
	SHC	229	291	349	250	328	394	276	370	421
	KW	46.1	44.4	42.7	46.8	45.2	43.8	47.3	45.8	44.9
100	TC	432	402	373	444	416	391	454	427	412
	SHC	225	286	345	246	324	387	271	365	412
	KW	47.4	45.6	43.9	48.1	46.4	45.0	48.6	47.1	46.1
105	TC	421	392	364	432	405	382	441	416	402
	SHC	221	282	340	241	319	380	267	360	402
	KW	48.6	46.8	45.0	49.3	47.6	46.2	49.9	48.3	33.5
115	TC	398	371	346	408	383	364	415	393	272
	SHC	212	274	330	238	310	364	256	349	272
	KW	51.0	49.1	47.3	50.5	49.9	48.6	52.2	50.7	49.9

7

38ACO16-W/U, 38ACO12 W/M, 38ACO16 W/L OF 39ED32

TEMP (F) AIR ENT OUTDOOR UNIT		AIR ENT 39E COIL - CFM/BF								
		12000/.034			16,000/.058			20,000/.089		
		TEMP AIR ENT 39E INDOOR COIL (WB)								
		72	67	62	72	67	62	72	67	62
85	TC	523	486	450	542	506	474	554	519	497
	SHC	265	334	400	295	383	461	322	428	495
	KW	48.2	46.4	44.8	49.1	47.4	46.0	49.6	48.0	47.0
95	TC	500	464	430	517	483	454	527	496	476
	SHC	257	325	390	286	374	447	312	417	476
	KW	51.2	49.4	47.6	52.2	50.4	48.9	52.7	51.0	50.0
100	TC	488	453	420	504	471	444	513	483	466
	SHC	252	320	385	281	369	439	307	412	356
	KW	52.8	50.9	49.0	53.7	51.9	50.4	54.2	52.5	51.6
105	TC	475	442	410	491	459	434	499	471	455
	SHC	247	316	380	276	363	430	301	406	455
	KW	54.3	52.4	50.4	55.2	53.4	51.9	55.7	54.0	53.1
115	TC	---	419	389	---	---	413	---	---	---
	SHC	---	306	369	---	---	412	---	---	---
	KW	---	55.3	53.2	---	---	52.5	---	---	---

TC - TOTAL CAPACITY 1000 BTUH (GROSS-NO INDOOR FAN MOTOR HEAT DEDUCTED)

SHC - SENSIBLE CAPACITY 1000 BTUH

KW - TOTAL POWER INPUT TO 38AC(S) COMPRESSOR(S) & FANS

EWB - ENTERING WET BULB

BF - BYPASS FACTOR

U - UPPER
M - MIDDLE
L - LOWER

INDOOR COIL SECTION TO WHICH OUTDOOR UNIT IS CONNECTED IN RIGHT HAND COIL LOCATION.

INDOOR FAN MOTOR HEAT

39E MOTOR HORSEPOWER	AVERAGE EFFICIENCY
2	.76
3	.77
5	.79
7 1/2	.81
10	.83
15	.84
20	.85
25	.86
30	.87

INDOOR FAN MOTOR HEAT (BTUH) = $\frac{\text{BHP X 746 X 3.41}}{\text{EFF.}}$ (DRIVE LOSSES INCLUDED)

ON COOLING SUBTRACT INDOOR FAN MOTOR HEAT FROM GROSS TO ARRIVE AT NET.

$$EER = \frac{TC - IFM}{WATTS\ (38AC) + WATTS\ (IFM)}$$

INTEGRATED HEATING CAPACITIES

RATINGS ARE WITHOUT SUPPLEMENTARY HEAT AND ARE BASED ON 70F DB AIR ENTERING INDOOR COIL AND 70% RH AIR ENTERING OUTDOOR UNIT.

ON HEATING ADD IFM HEAT TO INTEGRATED CAPACITY FOR TOTAL HEATING EFFECT.

INDEX NO.	OUTDOOR UNITS U	M	L	INDOOR 39 E	CFM	TEMP OF AIR ENTERING OUTDOOR UNIT F(DB) -10 CAP	KW	0 CAP	KW	10 CAP	KW	17 CAP	KW	30 CAP	KW	40 CAP	KW	47 CAP	KW	50 CAP	KW	60 CAP	KW
1	012	---	---	08	3000	30	5.5	39	6.3	51	7.2	60	7.8	78	9.2	90	10.2	102	10.9	109	11.2	136	12.4
					4000	30	5.6	39	6.3	51	7.2	61	7.8	78	9.0	91	9.9	103	10.6	110	10.9	138	11.9
					5000	31	5.6	40	6.3	52	7.1	61	7.7	79	8.9	92	9.7	104	10.3	111	10.6	140	11.6
2	016	---	---	12	4500	41	7.8	56	9.0	74	10.3	87	11.3	114	13.1	132	14.5	149	15.5	158	15.9	195	17.5
					6000	42.2	7.8	57	9.0	75	10.2	89	11.1	116	12.8	134	14.0	150	14.9	160	15.2	199	16.5
					7500	42	7.8	58	9.0	76	10.2	90	11.0	117	12.6	134	13.7	152	14.4	161	14.8	200	16.0
3	012	---	012	15	6000	60	11.1	78	12.6	103	14.5	120	15.8	156	18.4	180	20.4	204	21.9	217	22.6	272	25.0
					8000	60	11.1	79	12.6	104	14.5	122	15.6	158	18.1	182	19.9	207	21.3	220	21.9	277	24.0
					10000	61	14.4	81	16.0	103	17.6	121	18.8	159	21.2	183	22.9	208	24.2	222	24.8	280	26.7
4	016	---	012	18	8000	71.7	13.4	96	15.4	126	17.6	148	19.2	194	22.4	236	24.8	253	26.6	270	27.3	337	30.1
					10000	72.5	13.4	97	15.3	127	17.5	150	19.0	196	22.0	227	24.2	256	25.8	272	26.5	340	29.0
					12000	72.4	13.3	99	15.4	128	17.4	151	18.9	197	21.7	227	23.8	257	25.3	274	26.0	343	28.3
5	016	---	016	21	9000	83	15.6	113	18.2	147	20.9	174	22.8	228	26.5	262	29.4	296	31.4	314	32.2	388	35.3
					12000	83	15.5	115	18.2	150	20.7	178	22.4	231	25.8	266	28.3	300	30.1	319	30.8	395	33.5
					14000	82	15.4	115	18.1	152	20.6	180	22.3	234	25.6	267	27.8	302	29.5	320	30.2	396	32.6
6	012	016	012	26	11000	102	18.9	135	21.7	177	24.9	208	27.0	270	31.4	311	34.8	352	37.2	374	38.2	465	42.0
					14000	102	18.9	137	21.7	179	24.7	210	26.8	273	30.8	314	33.9	356	36.1	378	37.1	472	40.5
					18000	103	18.9	138	21.6	181	24.6	213	26.6	276	30.4	317	33.2	359	35.2	382	36.1	478	39.1
7	016	012	016	32	12000	115	21.2	154	24.5	199	27.9	235	30.3	307	35.3	352	39.0	398	41.7	422	42.9	523	47.0
					16000	114	21.0	155	24.3	205	27.8	241	30.0	311	34.5	356	37.7	402	40.0	427	41.1	532	44.7
					20000	115	21.1	157	24.3	206	27.5	242	29.7	314	33.9	360	36.9	407	39.1	432	40.0	537	43.3

CAP - INTEGRATED HEATING CAPACITY GROSS 1000 BTUH - DOES NOT INCLUDE INDOOR FAN MOTOR HEAT. DEDUCTION FOR THERMAL LINE LOSSES OF 10 FT. OF UN-INSULATED PIPING EXPOSED TO OUTDOOR CONDITIONS HAS BEEN INCLUDED.

KW - POWER INPUT - INCLUDES COMPRESSOR MOTOR POWER INPUT AND OUTDOOR FAN MOTOR INPUT (1.2KW FOR EACH 38AC012, 1.8KW FOR EACH 38AC016.

APPLICATION DATA

COIL LOCATIONS - THE 39E/38AC HEAT PUMP OFFERING IS INTENDED FOR USE ONLY IN THE HORIZONTAL AND VERTICAL DRAW THRU ARRANGEMENTS INCLUDING THE ROOFRITE UNIT. FC FANS WILL HANDLE THE MAJORITY OF APPLICATIONS BUT AF IS AVAILABLE.

DUE TO POTENTIAL IMPROPER AIR DISTRIBUTION, NO BLOW-THRU OR FACE AND BYPASS PROVISIONS ARE AVAILABLE OR SHOULD BE ATTEMPTED.

REFERENCE THE ENCLOSED HEAT PUMP ASSEMBLY DIAGRAMS FOR OUR RECOMMENDATIONS ON COIL LOCATIONS WITHIN THE APPLICABLE 39E FLOW DIAGRAMS. KEEP IN MIND THE FOLLOWING GENERAL LIMITATIONS ARE AND MUST REMAIN IN EFFECT:

-- IMPROPER ENTERING AIR TEMPERATURES ACROSS THE INDOOR HEAT PUMP COIL ON HEATING AND COOLING DUTY MUST BE AVOIDED. FOR INSTANCE, STEAM, GLYCOL, AND ELECTRIC COILS IN THE PREHEAT POSITION COULD IMPOSE THEIR EXCESSIVE LAT'S ONTO THE INDOOR COIL EXCEEDING THE 70°F VALUE AROUND WHICH THE UNIT WAS DESIGNED AND TESTED.

-- IF ANY "LOW GRADE" TYPE COILS (SUCH AS RUN-AROUND LOOPS) ARE TO BE USED IN THE PREHEAT POSITION, CONTROLS ARE NECESSARY THAT ASSURE NO LESS THAN 55°F DB AND NO MORE THAN 70°F DB TEMPERATURES CAN OCCUR ACROSS THE HEAT PUMP COIL. CARRIER DOES NOT CONDONE USE OF PREHEAT IN GENERAL FOR HEAT PUMP DUTY.

-- SUPPLEMENTAL HEAT (ELECTRIC, STEAM, GLYCOL) SHOULD BE PLACED IN THE REHEAT POSITION FOR PURPOSES OF BOOSTING HEAT PUMP COIL CAPACITY (WHEN REQUIRED) AND TEMPERING THE DISCHARGE AIR DURING DEFROST.

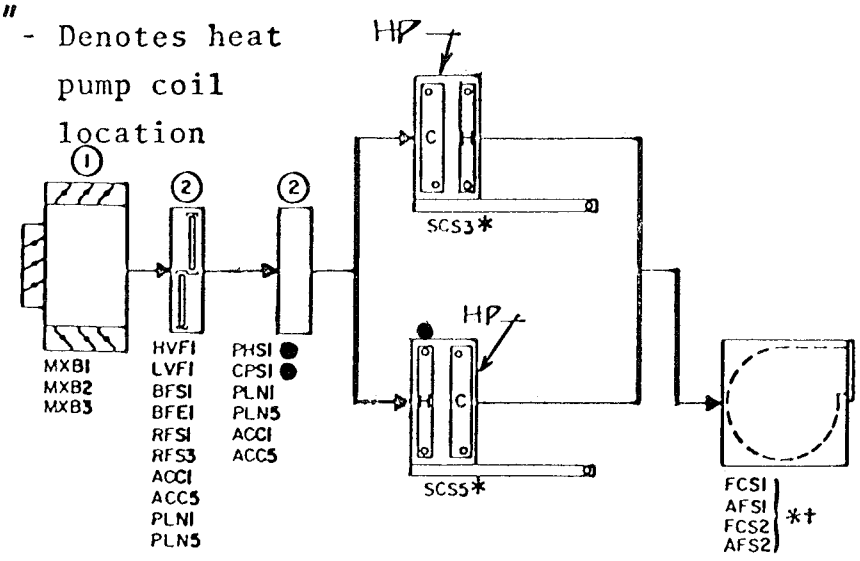
-- EXCESSIVE OR 100% OA APPLICATIONS ON HEATING OR COOLING SHOULD NOT EXIST. ON HEATING BELOW APPROXIMATELY 55°F EAT THE POTENTIAL OF FORMING ICE DURING DEFROST EXISTS ON THE INDOOR COIL. ALSO, DEFROST MODE MIGHT WELL BE PROLONGED DUE TO REDUCED AMBIENT (RETURN AIR TEMPERATURE) ACROSS THE INDOOR COIL.

HEAT PUMP COIL LOCATIONS

Horizontal draw-thru units with short coil section

DIAGRAM 1 – SIZES 08 THRU 32

"HP" - Denotes heat pump coil location



Application note:

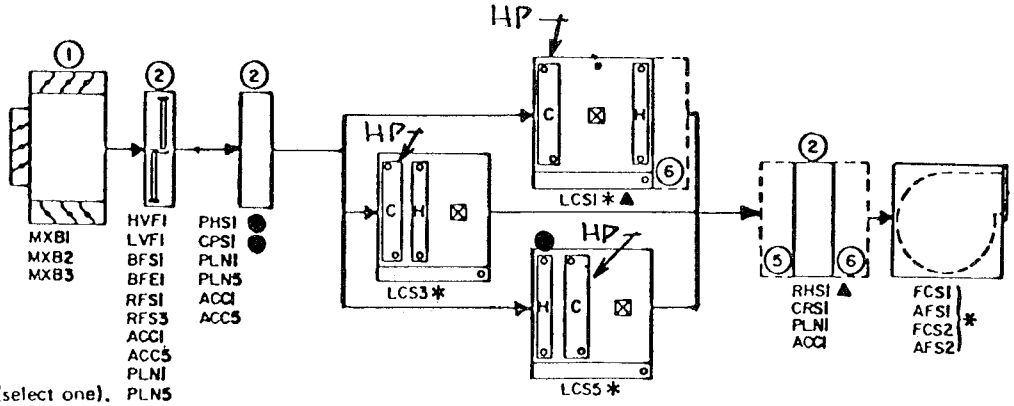
Heat pump systems using diagram 1 can only incorporate water or steam coils for supplemental heating. If electric heat is desired one of the other assembly diagrams (or duct heaters) must be used.

*Required (select one).
†Downblast discharge not available.
‡Not available with AFS.
▲Electric heat available only in components shown

NOTE● Denotes "low grade" heating coil locations such as run-around loop, see coil location data concerning pre-heat applications in general.

Horizontal draw-thru units with long coil section

DIAGRAM 3 SIZES 08 THRU 32



*Required (select one).
⊠Humidifier location (if ordered).
▲Electric heat available only in components shown.

① Only one component of this group may be used.

② One or more components may be used in any order.

⑤ When using electric heat, BFE1 required with integral control box, or PLN1 required with remote control box.

⑥ When using electric heat: (a) PLN1 required with THF, BHF, UBF and DB fan discharge or (b) ACC1 required with UBR fan discharge.

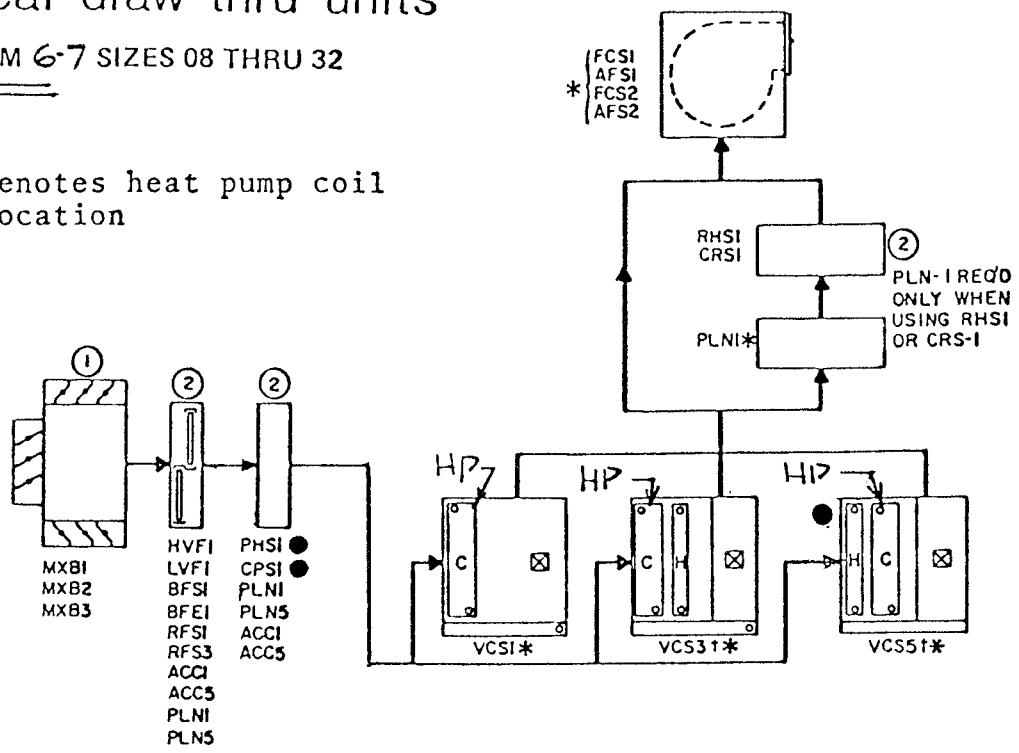
⑦ Not available with electric heat in SCS5.

HEAT PUMP COIL LOCATIONS

Vertical draw-thru units

DIAGRAM 6-7 SIZES 08 THRU 32

"HP" - Denotes heat pump coil location



*Required (select one).
†Not available on 08, 10 & 12 size units.

⊠Humidifier location (if ordered).

① Only one component of this group may be used

② One or more components may be used in any order.

NOTE● Denotes "low grade" heating coil locations such as run-around loop, see coil location data concerning pre-heat applications in general.

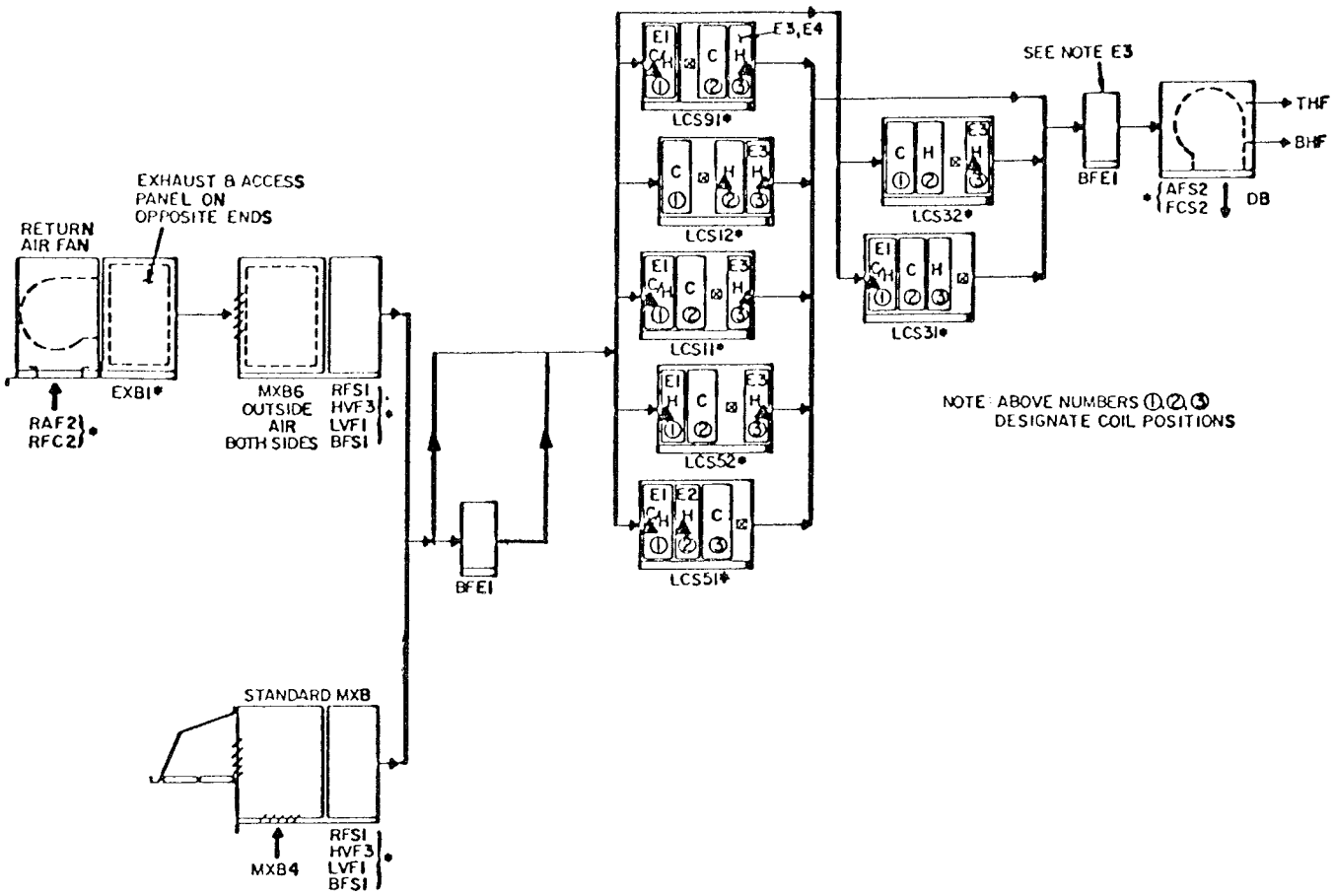
Application Note:

Heat pump systems using diagram6,7 can only incorporate water or steam coils for supplemental heating. If electric heat is desired one of the other assembly diagrams (or duct heaters) must be used.

39ER ASSEMBLY DIAGRAM

HEAT PUMP COIL LOCATIONS

DIAGRAM 10A (Sizes 08–32)



ELECTRIC HEAT NOTES:

E1 – BFE REQUIRED AHEAD OF COIL TO PROVIDE AIRWAY CLEARANCE BETWEEN FILTERS AND ELECTRIC HEAT COIL EXCEPT WITH HVF. HVF SECTION PROVIDES AMPLE AIRWAY CLEARANCE BETWEEN FILTERS AND ELECTRIC COIL.

E2 – ELECTRIC HEAT MAY BE USED IF COOLING COIL IS NOT IN C/H POSITION.

E3 – BFE MUST BE USED BETWEEN COIL AND FAN TO PROVIDE AIRWAY CLEARANCE WITH ELECTRIC HEAT COIL IN THIS LOCATION.

E4 – ELECTRIC HEAT CANNOT BE USED WITH COOLING COIL IN POSITION ②

* REQUIRED – SELECT ONE

▲ ELECTRIC HEAT AVAILABLE

REMOTE CONTROL BOX MUST BE USED ON UNITS WITH COIL CONNECTION HOUSING.

☒ HUMIDIFIER LOCATION NOT AVAILABLE WITH ELECTRIC HEAT DOWNSTREAM.

NOTE: ELECTRIC HEAT NOT INTENDED FOR USE IN THE PREHEAT POSITION. "LOW GRADE" RUN-AROUND LOOP TYPE HEATING COILS TO BE APPLIED IN THE PREHEAT POSITION AS PER LIMITATIONS IN ENCLOSED APPLICATION DATA.

REFRIGERANT PIPING

TWO FIELD INSTALLED LINES, ONE VAPOR AND ONE LIQUID, CONNECT THE 38AC OUTDOOR UNIT WITH EACH 39E INDOOR FACE-SPLIT COIL SECTION. SEE PHYSICAL DATA TABLE.

THE VAPOR LINE ON COOLING IS A SUCTION LINE, ON HEATING IT IS A HOT GAS LINE. THE LIQUID LINE STAYS LIQUID BUT REFRIGERANT FLOW DIRECTION REVERSES FROM THE COOLING TO HEATING MODE.

REFERENCE THE ATTACHED TYPICAL 38AC/39ED HEAT PUMP PIPING SCHEMATIC FOR ACTUAL REFRIGERANT FLOW PATH WITHIN THE SYSTEM.

FOR FIELD PIPING, FOLLOW STANDARD REFRIGERANT PIPING PRACTICES AS DETAILED IN CARRIER DESIGN MANUAL - PART 3.

FILTER DRIERS AND EXPANSION VALVES FOR EACH 39ED COIL ARE TO BE INSTALLED ON THE JOB AS PER COIL PIPING DIAGRAM.

NOTE THAT 38AC012 OUTDOOR UNITS USE R-500 AND 38AC016 UNITS USE R-22.

COIL PIPING

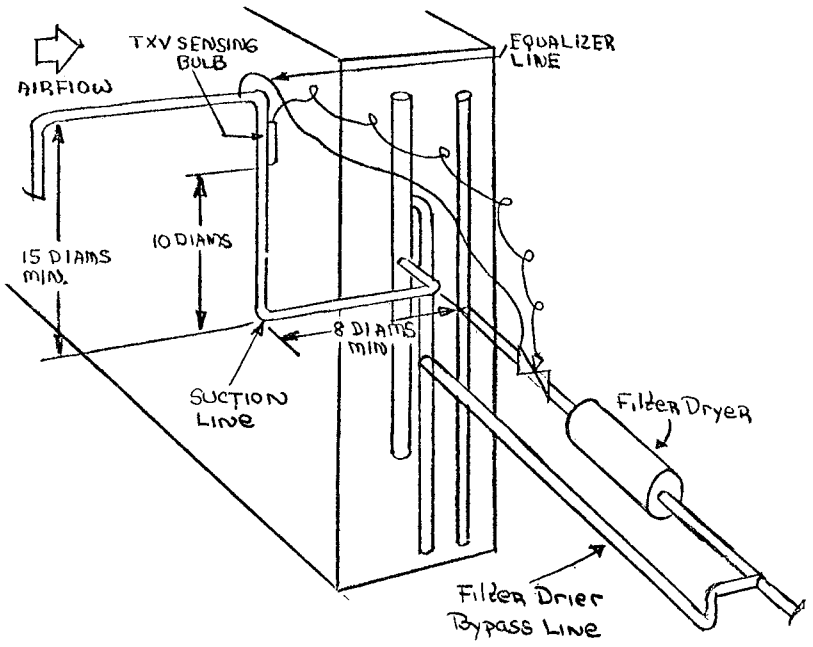
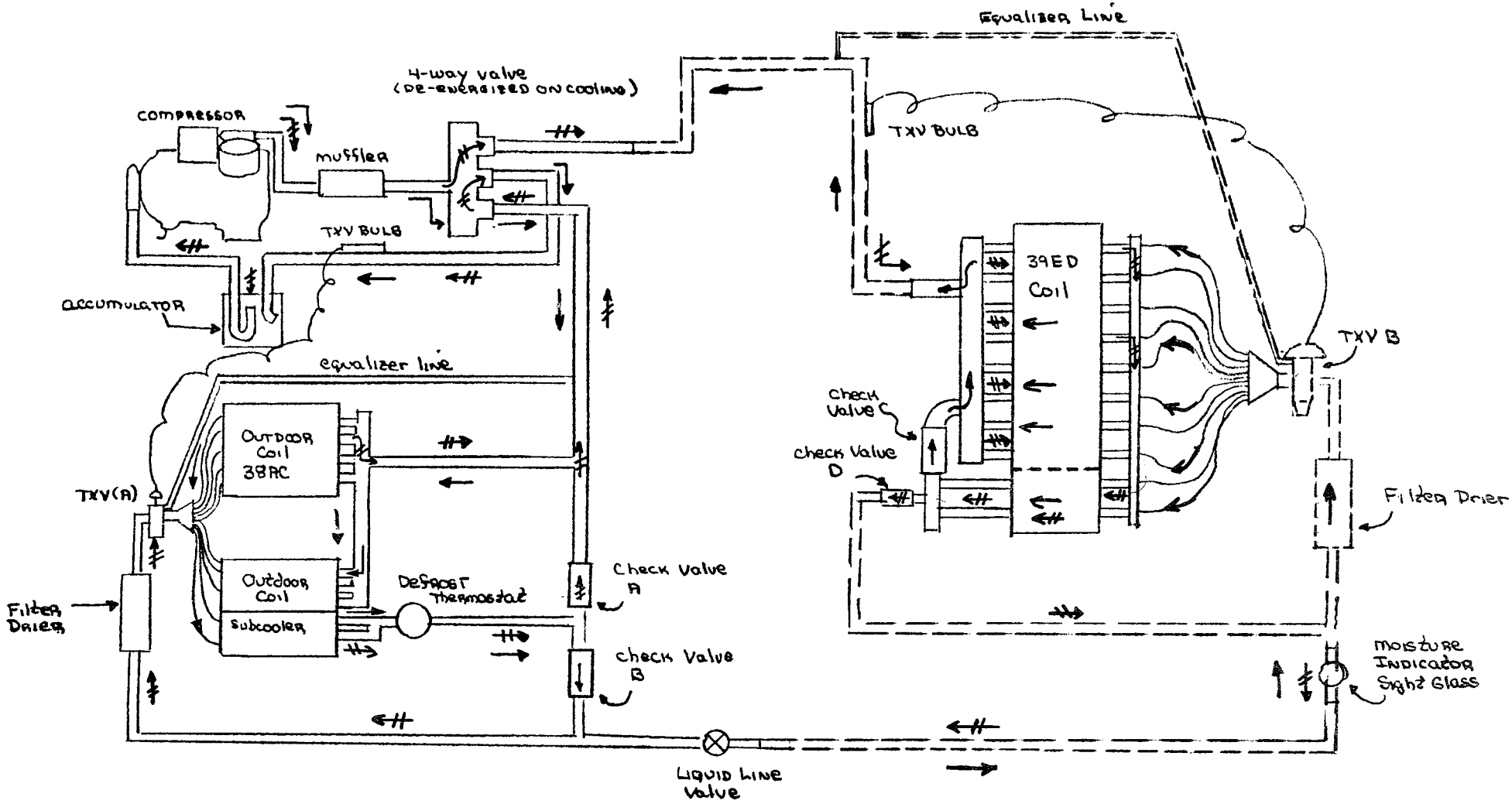


Fig. 1 Typical Coil Piping Connections

NOTES:

1. All coils are face split and coils with 2 or more units connected to them will have multiple sections similar to figure 1.
2. Connect all suction piping as shown in figure 1. Suction line from coil connection to end of 15 diameter-long riser should be same tube size as coil connection to insure proper refrigerant velocity for oil return. Refer to Carrier System Design Manual Part 3 for further piping details.
3. Suction connection(s) are on the air entering side when the coil is properly installed.
4. TXV(s), filter drier(s) and refrigerant nozzles are factory supplied. Refrigerant nozzles are installed in the refrigerant distributors TXV(s) and filter drier(s) are supplied and shipped inside the unit.
5. Solder expansion valve outlet directly to distributor using 95-5 tin antimony soft solder. Wrap wet cloths around valve body to prevent excessive heat from reaching the diaphragm and internal parts. Do not allow water to enter system.
6. Install the filter drier ahead of expansion valve.
7. Pipe the 5/8 bypass line from the outlet of the coil and tee into the liquid line ahead of the filter drier. This allows the refrigerant to bypass the filter drier in the heating mode, preventing back flushing the drier.
8. Insulate expansion valve body, diaphragm assembly and control bulb area to prevent charge migration and excessive condensation.



TYPICAL 39ED/38AC PIPING SCHEMATIC

FACTORY PIPING

FIELD PIPING

HEATING

COOLING

HEATING CYCLE

--- REFER TO PIPING SCHEMATIC ---

1. Hot gas from compressor flows thru muffler to reversing valve.

2. Hot gas is directed to header on indoor coil where it is condensed (Check valve C is closed). It leaves the coil and flows thru a header and enters the lower circuits where it is subcooled.

3. Liquid then flows thru check valve D, the outdoor filter drier TXV(A), distributor and feeder tubes into outdoor coil where it is evaporated into vapor. (Entire coil is an evaporative surface during this cycle).

4. Cool vapor from the outdoor coil subcooler is pulled thru check valve A and meets with gas flowing from the remainder of the outdoor coil. (Check valve B is closed)

5. Cool vapor flow thru the 4-way valve where it is directed to the accumulator and into the compressor suction valve to repeat the cycle.

COOLING CYCLE

1. Hot gas from compressor flows thru muffler to 4-way valve.

2. Hot gas is directed to header on outdoor coil (check valve A closed).

3. Header directs hot gas to individual coil circuits where it is condensed to liquid.

4. Liquid flowing out of outdoor coil makes 180 degrees turn in the distributor and flows thru distributor tubes to and thru subcooler. TXV(A) is closed because of high equalizer pressure and low TXV bulb temperature.

5. Subcooler liquid flows through check valve B, liquid line valve, filter drier and TXV valve B (check valve D is closed).

6. Cool vapor flows thru the indoor coil (check valve C is open) to the suction header.

7. Cool vapor flows from the indoor coil to the 4-way valve where it is directed to the accumulator and then to the compressor suction valve to repeat cycle.

REFRIGERANT CHARGE AND PIPING SELECTION DATA

OUTDOOR UNIT	LENGTH OF PIPING (FT)*					
	0-25		26-60		61-100	
	LINE SIZE (IN. OD)					
	L	V	L	V	L	V
38AC012 (R-500)	5/8	1 3/8	3/4	1 5/8	3/4	1 5/8
38AC016 (R-22)	3/4	1 3/8	7/8	1 5/8	7/8	1 5/8
	APPROX SYSTEM CHARGE (LB)					
38AC012	36		49		55	
38AC016	45		55		68	

L - LIQUID LINE

V - VAPOR LINE

*APPROXIMATELY 4 ELBOWS ASSUMED IN DETERMINING PIPE SIZES.

MAXIMUM LENGTH OF INTERCONNECTING PIPING IS 100 FEET.

APPROXIMATE SYSTEM CHARGE IS FOR ESTIMATING ONLY. IT INCLUDES CHARGE REQUIREMENTS FOR ONE OUTDOOR UNIT, MATCHING INDOOR COIL, AND INTER-CONNECTING PIPING. SYSTEM SHOULD BE CHARGED IN ACCORDANCE WITH INSTALLATION INSTRUCTIONS.

MAXIMUM VERTICAL SEPARATION

SYSTEM INDEX NO.	OUTDOOR UNIT 38AC		INDOOR UNIT	
	012	016	ABOVE (FT)	BELOW (FT)
1	1	---	60	30
2	---	1	60	30
3	2	---	60	30
4	1	1	60	30
5	---	2	60	30
6	2	1	60	30
7	1	2	60	30

POWER SUPPLY AND WIRING

WIRING MUST COMPLY WITH NATIONAL ELECTRIC CODE AND ALL LOCAL CODE REQUIREMENTS. CHECK THE AVAILABLE POWER SUPPLY WITH UNIT NAMEPLATE INFORMATION. WIRING DIAGRAMS FOR A SUGGESTED METHOD OF CONNECTING THE VARIOUS HEAT PUMP COMBINATIONS IN THE FIELD ARE SHOWN IN FIGURES 1 THRU 4. FOR WIRING DETAILS AND SCHEMATICS OF COMPONENTS, REFER TO THE LITERATURE COVERING THE COMPONENTS.

38AC EMERGENCY HEAT FIELD WIRING	FIG. 1
SYSTEM 1 AND 2 FIELD WIRING DIAGRAM	FIG. 2
SYSTEM 3, 4 AND 5 FIELD WIRING DIAGRAM	FIG. 3
SYSTEM 6 AND 7 FIELD WIRING DIAGRAM	FIG. 4

LEGEND (FOR FIG. 1 THRU 4)

DFR - DEFROST RELAY

FD - FUSED DISCONNECT

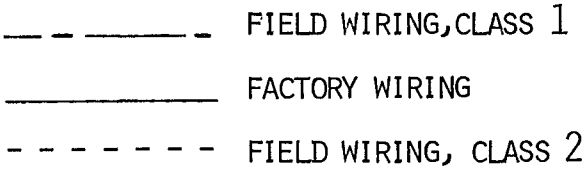
IFC - INDOOR FAN CONTACTOR

IFR - INDOOR FAN RELAY

ODT - OUTDOOR THERMOSTAT

R - RELAY

SHR - STRIP HEAT RELAY



38AC EMERGENCY HEAT FIELD WIRING

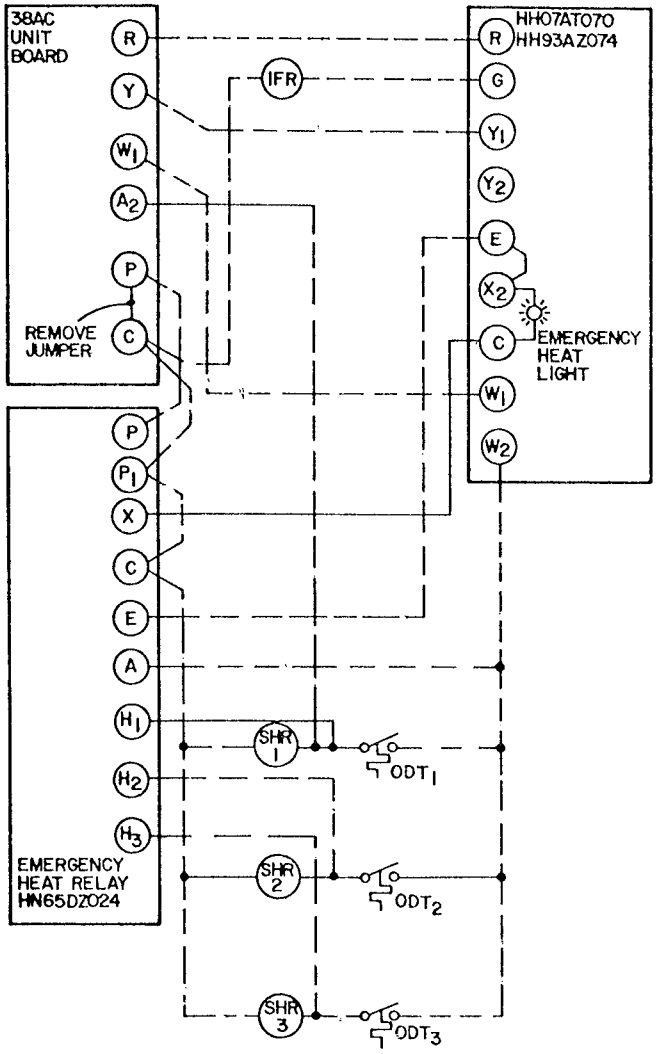
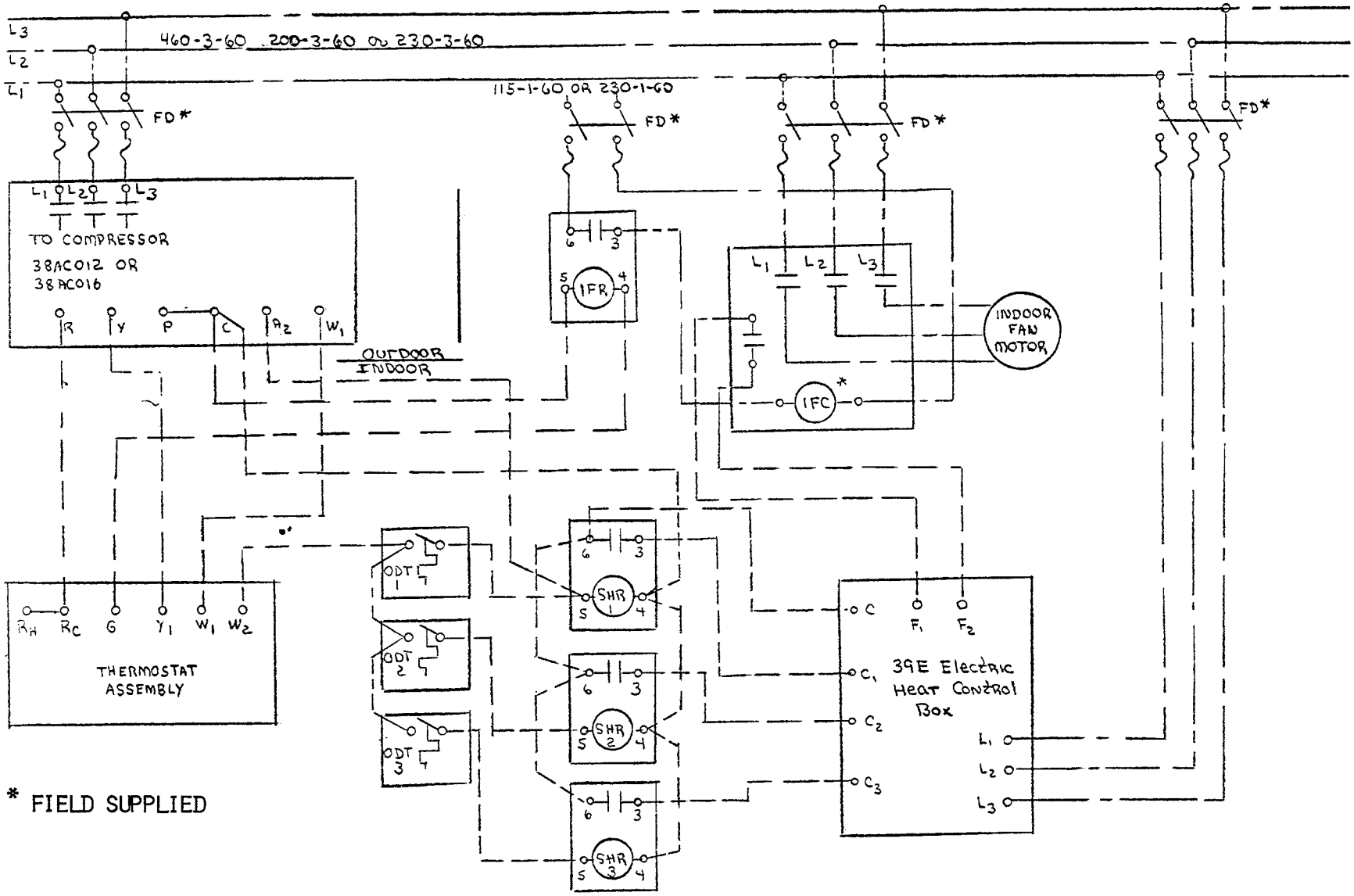


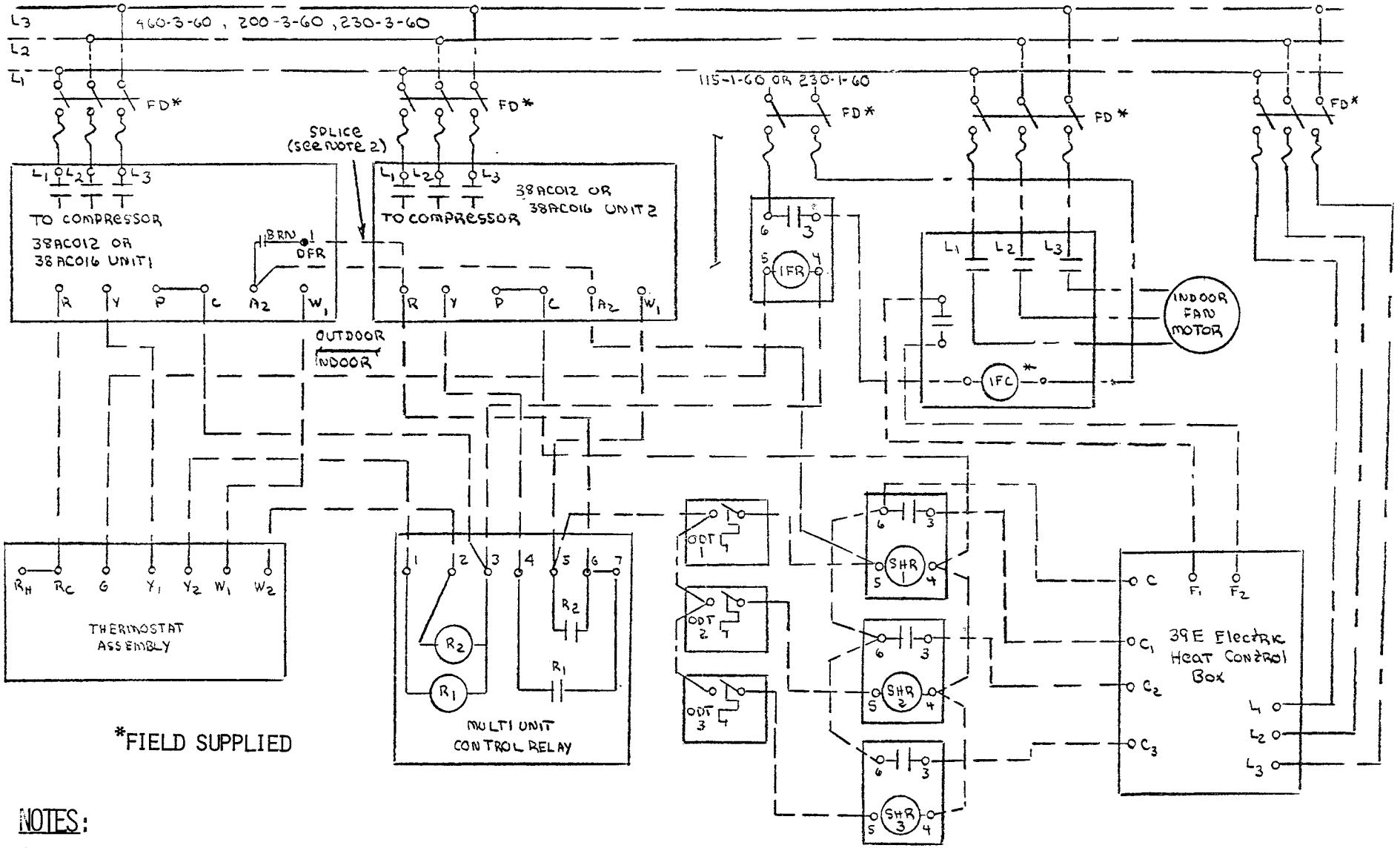
Fig. 1 – Control Circuit Wiring with Emergency Heat Switch



NOTES:

1. For wiring details of components, refer to schematic of each component.
2. If more than 3 steps of electric heat are used in the 39E electric heaters, then 3 steps should be created by adding jumper(s) in the 39E control box from C1 to C4 (Step 4), C2 to C5 (Step 5), etc.

FIG. 2-FIELD WIRING DIAGRAM, SYSTEM 1 (38AC012/39E08), SYSTEM 2 (38AC016/39E12)

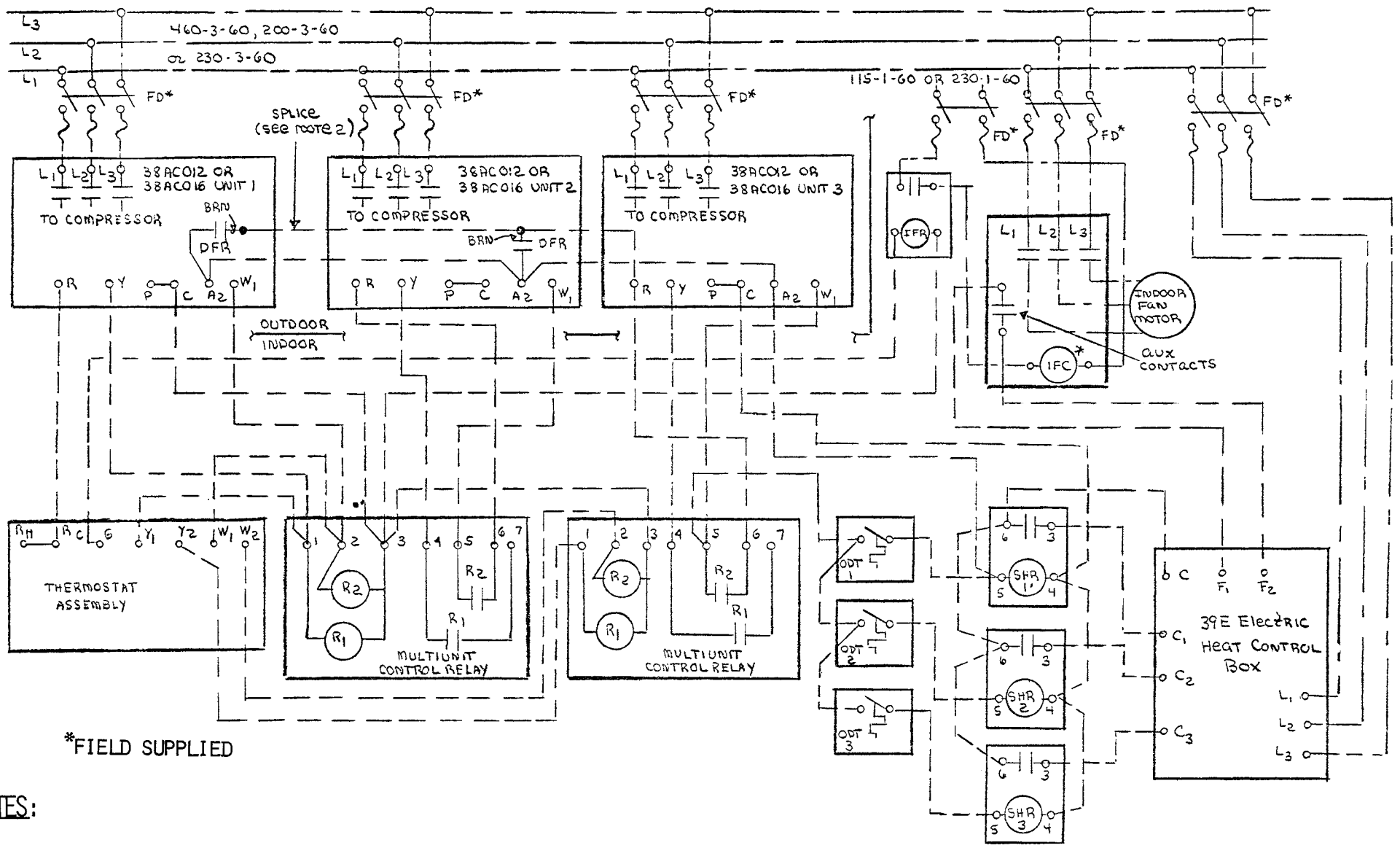


NOTES:

1. For wiring details of components, refer to schematic of each component.
2. Remove the brown wire (BRN) from terminal 5 TB3 on unit 1. Splice this wire and connect to terminal R, TB2 on unit 2. Connect all A2 terminals together (Refer to label diagrams)
3. If more than 3 steps of electric heat are used in the 39E eletric heaters, then 3 steps should be created by adding jumper(s) in the 39E control box from terminal C1 to C4 (Step 4), C2 to C5 (Step 5), etc.

FIG. 3-FIELD WIRING DIAGRAM

SYSTEM 3 (2-38ACO12'S/39E15), SYSTEM 4 (1-38ACO12, 1-38ACO16/39E18), SYSTEM 5 (2-38ACO16'S/39E21)



NOTES:

1. For wiring details of components, refer to schematic of each component.
2. Remove the brown wire (BRN) from terminal 5 TB3 on unit 1 & 2. Splice the wires together and connect to terminal R, TB2 on unit 3. Connect all A2 terminals together (Refer to lavel diagrams).
3. If more than 3 steps of electric heat are used in the 39E electric heaters, then 3 steps should be created by adding jumper(s) in the 39E control box from C1 to C4 (Step 4), C2 to C5 (Step 5), etc.
4. No more than three steps of electric heat can be used on the 39E, becuase the additional realys (SHR's) would exceed the VA capacity of the 38AC units.

FIG. 4-FIELD WIRING DIAGRAM

SYSTEM 6 (2-38ACO12'S, 1-38ACO16/39E26), SYSTEM 7 (2-38ACO16'S, 1-38ACO12/39E32)

CONTROL SEQUENCE

Assume the power is on and the thermostat is set at System Auto., Fan Auto., and Desired Temperature.

SINGLE 38AC OUTDOOR UNIT-SYSTEMS 1, 2

COOLING (SINGLE-STAGE ONLY)

When the thermostat calls for cooling, the indoor fan motor, outdoor fan motors, and Time Guard circuit timer are energized. After 15 seconds, the compressor will start. If the compressor shuts down for any reason, the timer prevents restart for 4 minutes and 45 seconds.

HEATING

FIRST STAGE - When the thermostat calls for heating, the indoor fan motor, outdoor fan motors, reversing valve and Time Guard circuit timer are energized. The compressor starts about 15 seconds after the fans start.

SECOND STAGE - The second stage of the thermostat energizes the heating control relay(s) and electric resistance heater element(s) if outdoor air thermostats are closed.

If the compressor shuts down for any reason, the timer prevents restart for 4 minutes and 45 seconds.

DEFROST CYCLE

Defrost is initiated every 90 minutes on the 38AC012 (60 minutes on the 38AC016). The defrost timer motor contacts close for 20 seconds and if the defrost stat is closed, the reversing valve and outdoor fans are de-energized. The unit operates on this modified cooling mode to defrost the coil. This defrost cycle continues until the defrost thermostat opens or 10 minutes have elapsed.

When the unit is in the defrost cycle, the first step of electric resistance heat will be energized to prevent cold air recirculation during this modified cooling mode. Second and third steps of electric heat will be energized only if their outdoor air thermostats are closed.

AIR CIRCULATION

When the fan switch is at Fan On, the indoor air fans operate continuously to provide ventilation. The thermostat operates the other components as described above.

EMERGENCY HEAT CYCLE

If the compressor is inoperative due to a tripped safety device, the second stage of the thermostat automatically energizes the indoor air fan and the electric resistance heaters.

If desired, the compressor can be manually locked out by setting the thermostat at Emergency Heat. In this instance, the emergency heat indicator light on the thermostat assembly is illuminated.

MULTIPLE 38AC OUTDOOR UNIT SYSTEMS-3,4,5,6 & 7

COOLING

FIRST STAGE - When the thermostat calls for cooling, the indoor fan motor and outdoor unit no. 1 are energized simultaneously. After 15 seconds, the Time Guard circuit timer will allow the compressor to start. If there are 3 outdoor units in the system, unit no. 2 will also be energized.

SECOND STAGE - The second stage of the thermostat energizes outdoor unit no. 2 or, if there are 3 outdoor units in the system, outdoor unit no. 3.

If an outdoor unit shuts down for any reason, the Time Guard circuit timer prevents restart for 4 minutes and 45 seconds.

HEATING

FIRST STAGE - When the thermostat calls for heating, the indoor fan motor and outdoor unit no. 1 are energized simultaneously. After 15 seconds, the Time Guard circuit timer will allow the compressor to start. If there are 3 outdoor units in the system, unit no. 2 will also be energized.

SECOND STAGE - The second stage of the thermostat energizes outdoor unit no. 2 or, if there are 3 outdoor units in the system, outdoor unit no. 3. Also, electric resistance heaters can be controlled by the second stage of the thermostat and individual outdoor air thermostats.

If any of the outdoor units should shut down for any reason, the Time Guard circuit timer prevents its restarting for 4 minutes and 45 seconds.

DEFROST CYCLE

Each outdoor unit will defrost in response to its own defrost controls as detailed in single 38AC system defrost cycle.

AIR CIRCULATION

When the fan switch is at Fan On, the indoor air fans operate continuously to provide ventilation. The thermostat operates the other components as described above.

THERMOSTAT AND SUBBASE RECOMMENDATIONS

SYSTEMS	1, 2 (SINGLE 38AC)		3,4,5,6,7 (MULTIPLE 38AC)	
THERMOSTAT	HH07AT070	HH07AT070	HH07AT072	HH07AT072
SUBBASE	HH93AZ074	HH93AZ076	HH93AZ074	HH93AZ076
COOLING STAGES	1	1	2	2
HEATING STAGES	2	2	2	2
CHANGEOVER	AUTO	AUTO	AUTO	AUTO
*EMERGENCY HEAT	YES	---	YES	---

* EMERGENCY HEAT RELAY HN65DZ024 REQUIRED.
(ORDER THRU SERVICE PARTS)

ELECTRICAL DATA

UNIT	V-PH-HZ	VOLTAGE RANGE		COMPR		FAN MOTOR		POWER SUPPLY	
		MIN	MAX	LRA	RLA	QTY	FLA	MIN CKT AMPS	MAX FUSE AMPS
38AC012	200-3-60	180	229	191	50.0	2	3.2	69	110
	230-3-60	207	264	172	45.0	2	3.2	63	100
	460-3-60	414	528	86	22.2	2	(1) 1.6, (1) 1.8	31	50
38AC016	200-3-60	180	229	266	64.0	3	3.2	91	150
	230-3-60	207	264	240	58.0	3	3.2	83.1	125
	460-3-60	414	528	120	29.0	3	(2) 1.6, (1) 1.8	42	70

FLA - FULL LOAD AMPS
LRA - LOCKED ROTOR AMPS
RLA - RATED LOAD AMPS

INDOOR UNIT

39ED,ER	RANGE OF FAN MOTOR HORSEPOWER	FAN MOTOR
08	2 - 7 1/2	200, 230/460 OR 575 (3 PHASE)
12	2 - 10	
15	2 - 15	
18	3 - 15	
21	3 - 20	
26	5 - 25	
32	5 - 30	