



Manual S Information

Sample House

Performed on ACCA approved software-Elite

Additional information available on Manual J

Equipment: System 1-Bsmt

Furnace: Carrier Model # 59SC2C080S17--16 (80000 BTU)

(Optional Coil and Condenser)

Coil: Carrier Model # CNPV*3617AL*+TDR (3 Ton)

Condenser: Carrier Model # 24ABB324(A,W)*N31* (2 ton)

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary			
Number of active trunks:	19		
Number of active runouts:	17		
Total runout outlet airflow:	971		
Main trunk airflow:	806		
Largest trunk diameter:	15.2	SMT-100	
Largest runout diameter:	6	SR-170	
Smallest trunk diameter:	12	ST-140	
Smallest runout diameter:	3	SR-120	
Supply fan external static pressure:	0.800		
Supply fan device pressure losses:	0.217		
Supply fan static pressure available:	0.583		
Runout maximum cumulative static pressure loss:	0.446	SR-130	
Return loss added to supply:	0.122		
Total effective length of return (ft.):	460.5	GS Ceiling	
Total effective length of supply (ft.):	315.7	SR-130	
Overall total effective length (ft.):	776.2	GS Ceiling to SR-130	
Design overall friction rate per 100 ft.:	0.075	(Available SP x 100 / TEL)	
System duct surface area (Scenario 1):	678.7	Main	(Linked to duct load)
Total system duct surface area:	678.7		



Furnace Info

Heat Rise Used 60 Degrees

SPECIFICATIONS

Heating Capacity and Efficiency			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20		
Input	High Heat	(BTUH)	40,000	40,000	60,000	60,000	80,000	80,000	100,000	100,000	120,000		
	High Heat	(BTUH)	37,000	37,000	56,000	56,000	75,000	75,000	93,000	93,000	112,000		
Certified Temperature Rise Range °F (°C)		High Heat	40-70 (22 - 39)	35 - 65 (19 - 36)	40 - 70 (22 - 39)	35 - 65 (19 - 36)	35 - 65 (19 - 36)	35 - 65 (19 - 36)	40 - 70 (22 - 39)	40 - 70 (22 - 39)	45 - 75 (25 - 42)		
Airflow Capacity and Blower Data			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20		
Rated External Static Pressure (in. W.C.)	Heating		0.10	0.10	0.12	0.12	0.15	0.15	0.20	0.20	0.20		
	Cooling		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		
Airflow Delivery @ Rated ESP (CFM)	High Heat		910	980	910	980	1030	1115	1480	1550	2070		
	Cooling		970	1140	1155	1505	1555	1885	1490	1970	2050		
Cooling Capacity (tons)	400 CFM/ ton		2.5	2.5	2.5	3.5	4	4.5	3.5	5	5		
	350 CFM/ ton		2.5	3	3	4	4.5	5.0	4	5.5	5.5		
Direct-Drive Motor Type			Permanent Split Capacitor (PSC)										
Direct-Drive Motor HP			0.3	0.5	0.3	0.5	0.5	0.75	0.5	0.75	0.75		
Motor Full Load Amps			4.6	6.8	4.6	7.9	7.4	7.9	6.5	11.1	11.1		
RPM Range			500 - 1150										
Speed Selections			4	5	4	4	5	5	4	4	4		
Blower Wheel Dia x Width	in.		11 x 7	11 x 8	11 x 7	11 x 8	11 x 8	11 x 10	11 x 10	11 x 10	11 x 11		
Air Filtration System			Field Supplied										
Filter Used for Certified Watt Data*			KGAWF**D6UFR										
Electrical Data			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20		
Input Voltage	Volts-Hertz-Phase								115-60-1				
Operating Voltage Range	Min-Max								104 - 127				
Maximum Input Amps	Amps		5.2	7.4	5.3	8.6	8.1	8.6	7.3	11.9	11.9		
Unit Ampacity	Amps		7.5	10.3	7.6	11.7	11.1	11.7	10.1	15.8	15.8		
Minimum Wire Size	AWG		14	14	14	14	14	14	14	12	12		
Maximum Wire Length @ Minimum Wire Size	Feet		49	36	48	31	33	31	36	36	36		
	(M)		(14.9)	(11.0)	(14.6)	(9.4)	(10.1)	(9.4)	(11.0)	(11.0)	(11.0)		
Maximum Fuse/Ckt Bkr (Time-Delay Type Recommended)	Amps		15	15	15	15	15	15	15	20	20		
Transformer Capacity (24vac output)									40 VA				
External Control Power Available	Heating								27.9 VA				
	Cooling								34.6 VA				
Controls			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20		
Gas Connection Size									1/2" - NPT				
Burners (Monoport)			2	2	3	3	4	4	5	5	6		
Gas Valve (Redundant)									White Rodgers				
Minimum Inlet Gas pressure (in. W.C.)									4.5				
Maximum Inlet Gas pressure (in. W.C.)									13.6				
Ignition Device									Silicon Nitride				
Limit Control			195	180	220	190	185	195	220	220	165		
Heating Blower Control (Heating Off-Delay)									Adjustable: 90, 120, 150, 180 seconds				
Cooling Blower Control (Time Delay Relay)									90 seconds				
Communication System									none				
Thermostat Connections									Com 24V, R, W, G, Y				
Accessory Connections									EAC (115vac); HUM (24vac)				
* See Accessory List for part numbers available.													



Fan Performance

AIR DELIVERY - CFM (BOTTOM RETURN WITH FILTER)

Furnace	Return Air Connection	Wire Lead Color	Cooling Tons	CFM / Ton	Test Airflow Delivery @ Various External Static Pressures									
					0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
040-10	SIDE/BOTTOM	Black	2.5	388	1145	1100	1060	1015	970	920	860	785	680	615
		Blue	2.0	413	970	940	905	870	825	775	730	675	570	505
		Yellow	2.0	385	910	880	845	810	770	725	675	600	535	475
		Red	1.5	397	725	695	665	635	595	555	510	460	390	340
060-12	SIDE/BOTTOM	Black	3.0	385	1215	1205	1205	1195	1155	1100	1045	975	910	805
		Blue	2.5	370	980	985	980	955	925	880	835	780	695	585
		Yellow	2.0	425	910	920	905	880	850	815	765	695	630	545
		Red ³	1.5	430	750	730	705	680	645	605	555	490	435	370
040-12	SIDE/BOTTOM	Black	3.0	380	1365	1310	1255	1200	1140	1080	1015	950	860	795
		Yellow	2.5	418	1245	1200	1150	1100	1045	990	930	855	790	730
		Orange	2.5	366	1050	1025	985	950	915	870	820	760	705	655
		Blue	2.0	435	980	955	935	905	870	830	780	725	675	625
		Red	1.5	437	720	705	690	675	655	625	590	555	525	485
060-16	SIDE/BOTTOM	Black	4.0	376	1600	1545	1505	1475	1505	1445	1400	1330	1235	1140
		Yellow	3.5	377	1380	1340	1335	1330	1320	1285	1225	1155	1085	1000
		Blue ³	3.0	387	1190	1185	1195	1195	1160	1125	1075	1015	950	885
		Red ³	2.5	394	1030	1025	1030	1010	985	940	905	855	805	735
080-16	SIDE/BOTTOM	Black	4.0	389	1650	1620	1640	1605	1555	1495	1425	1345	1255	1165
		Yellow	3.5	381	1420	1425	1400	1370	1335	1290	1230	1170	1095	1015
		Orange	3.0	383	1205	1205	1185	1165	1150	1100	1055	1000	935	870
		Blue	2.5	384	1035	1020	1005	985	960	930	895	845	795	735
		Red	2.0	380	850	825	805	785	760	725	695	655	600	545
080-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	377	2225	2160	2070	1980	1885	1790	1690	1575	1460	1345
		Yellow	4.0	386	1690	1665	1640	1595	1545	1485	1410	1330	1235	1135
		Orange	3.5	397	1485	1470	1455	1430	1390	1340	1280	1205	1120	1035
		Blue ³	2.5	426	1120	1110	1100	1090	1065	1035	990	935	870	805
		Red ³	2.0	433	940	920	910	890	865	830	790	745	690	625
100-16	SIDE/BOTTOM	Black	4.0	373	1715	1660	1610	1555	1490	1420	1340	1245	1150	1065
		Yellow ³	3.5	379	1535	1480	1435	1380	1325	1260	1180	1095	1010	910
		Blue ³	3.0	367	1300	1255	1205	1160	1100	1035	970	905	810	730
		Red ³	2.0	445	1110	1055	1005	955	890	835	770	690	610	535
100-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	394	2270	2205	2130	2055	1970	1880	1780	1670	1555	1425
		Yellow	5.0	367	2090	2040	1980	1910	1835	1755	1670	1570	1460	1340
		Blue	4.0	416	1850	1815	1775	1725	1665	1600	1525	1435	1335	1225
		Red	3.5	421	1580	1550	1540	1515	1475	1420	1355	1280	1190	1100
120-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	410	2385	2310	2230	2150	2050	1920	1780	1650	1540	1415
		Yellow	5.0	369	2130	2070	2010	1940	1845	1740	1630	1525	1420	1305
		Blue	4.0	416	1875	1840	1795	1735	1665	1580	1495	1410	1310	1205
		Red ³	3.5	414	1610	1585	1555	1515	1450	1395	1325	1250	1160	1080



Coil Performance Data

PERFORMANCE DATA (cont.)

COIL STATIC PRESSURE DROP (in. w.c.) PURON and R-22 REFRIGERANTS

UNIT SIZE	Standard CFM																				
	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200		
1814	Dry																				
	0.078	0.114	0.156	0.198	0.253																
1917	Dry																				
	0.042	0.060	0.080	0.102	0.128																
2414	Dry																				
	0.070	0.103	0.143	0.182	0.233	0.290	0.354														
2417	Dry																				
	0.048	0.068	0.090	0.112	0.140	0.170	0.203														
3014	Dry																				
	0.065	0.097	0.135	0.173	0.223	0.278	0.339	0.405	0.478												
3017	Dry																				
	0.042	0.060	0.080	0.102	0.128	0.157	0.188	0.222	0.259												
3117	Dry																				
	0.031	0.046	0.063	0.083	0.105	0.130	0.156	0.193	0.230												
3617 T3617	Dry																				
	0.043	0.061	0.082	0.103	0.128	0.157	0.189	0.221	0.259	0.299	0.341										
3621	Dry																				
	0.035	0.048	0.062	0.076	0.093	0.111	0.132	0.153	0.177	0.201	0.228										
3717	Dry																				
	0.025	0.038	0.054	0.072	0.093	0.117	0.143	0.171	0.205	0.233	0.273										
4217	Dry																				
			0.072	0.093	0.118	0.145	0.175	0.206	0.243	0.281	0.322	0.366	0.413								
4221 T4221	Dry																				
	0.030	0.041	0.054	0.066	0.082	0.099	0.118	0.137	0.158	0.180	0.205	0.231	0.259								
4324	Dry																				
			0.053	0.062	0.073	0.084	0.097	0.111	0.126	0.138	0.154	0.172	0.190	0.210							
4821 T4821	Dry																				
			0.047	0.060	0.075	0.092	0.110	0.130	0.152	0.176	0.204	0.230	0.256	0.284	0.318						
4824	Dry																				
			0.015	0.046	0.057	0.069	0.094	0.100	0.119	0.124	0.140	0.158	0.175	0.195	0.214						
6024 T6024	Dry																				
					0.062	0.073	0.084	0.097	0.111	0.126	0.138	0.154	0.172	0.190	0.210	0.228	0.251	0.273	0.293		
6124 T6124	Dry																				
					0.082	0.096	0.112	0.129	0.145	0.163	0.171	0.191	0.212	0.235	0.258	0.283	0.310	0.336	0.366		
	Dry																				
											0.130	0.140	0.160	0.180	0.200	0.220	0.240	0.270	0.290		
	Wet																				
											0.150	0.170	0.190	0.210	0.230	0.260	0.290	0.310	0.340		

CNRY / CNRV



Condenser Specs

EVAPORATOR AIR		CONDENSER ENTERING								
CFM	EWB °F (°C)	75 (23.9)			85 (29.4)			95 (35)		
		Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**
		Total	Sens±		Total	Sens±		Total	Sens±	
24ABB324										
700	72 (22.2)	27.09	13.27	1.65	25.82	12.82	1.85	24.63	12.41	2.06
	67 (19.4)	24.89	16.41	1.65	23.83	15.99	1.84	22.71	15.56	2.05
	63 (17.2)††	23.39	15.98	1.64	22.38	15.55	1.84	21.29	15.11	2.05
	62 (16.7)	23.01	19.56	1.64	22.03	19.14	1.84	20.99	18.67	2.05
	57 (13.9)	22.46	22.46	1.64	21.66	21.66	1.83	20.79	20.79	2.05
800	72 (22.2)	27.52	13.92	1.69	26.15	13.46	1.88	24.91	13.04	2.10
	67 (19.4)	25.25	17.44	1.68	24.16	17.03	1.88	23.00	16.60	2.09
	63 (17.2)††	23.76	16.95	1.68	22.72	16.53	1.87	21.60	16.08	2.09
	62 (16.7)	23.47	20.99	1.68	22.49	20.52	1.87	21.52	21.52	2.09
	57 (13.9)	23.30	23.30	1.68	22.44	22.44	1.87	21.53	21.53	2.09
900	72 (22.2)	27.79	14.53	1.73	26.41	14.07	1.92	25.10	13.63	2.13
	67 (19.4)	25.51	18.45	1.72	24.38	18.03	1.91	23.21	17.59	2.13
	63 (17.2)††	24.03	17.89	1.72	22.96	17.47	1.91	21.82	17.01	2.12
	62 (16.7)	23.97	23.97	1.72	23.07	23.07	1.91	22.11	22.11	2.12
	57 (13.9)	23.96	23.96	1.72	23.07	23.07	1.91	22.11	22.11	2.12

Total Gain From Manual J=14265

Sensible Capacity of AC above: 16080 Sensible

$14265/16080 = .88$ or 12% Over



Equipment: System 2-Main Floor-Left Side

Furnace: Carrier Model # 59SC2C080S21--20 (80000 BTU)

Coil: Carrier Model # CNPV*4821AL*+TDR (4 Ton)

Condenser: Carrier Model # 24ABB342(A,W)*N30* (3.5 ton)

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary

Number of active trunks:	21		
Number of active runouts:	21		
Total runout outlet airflow:	1,594		
Main trunk airflow:	1,575		
Largest trunk diameter:	18.6	ST-400	
Largest runout diameter:	7	SR-250	
Smallest trunk diameter:	12	ST-360	
Smallest runout diameter:	3	SR-280	
Supply fan external static pressure:	0.800		
Supply fan device pressure losses:	0.316		
Supply fan static pressure available:	0.484		
Runout maximum cumulative static pressure loss:	0.615	SR-320	
Return loss added to supply:	0.182		
Total effective length of return (ft.):	521.6	Hall 5 High	
Total effective length of supply (ft.):	265.8	SR-320	
Overall total effective length (ft.):	787.4	Hall 5 High to SR-320	
Design overall friction rate per 100 ft.:	0.061	(Available SP x 100 / TEL)	
System duct surface area (Scenario 1):	859.9	Main	(Linked to duct load)
Total system duct surface area:	859.9		



Furnace Info

Heat Rise Used 60 Degrees

SPECIFICATIONS

Heating Capacity and Efficiency			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20
Input	High Heat	(BTUH)	40,000	40,000	60,000	60,000	80,000	80,000	100,000	100,000	120,000
	High Heat	(BTUH)	37,000	37,000	56,000	56,000	75,000	75,000	93,000	93,000	112,000
Certified Temperature Rise Range °F (°C)		High Heat	40-70 (22 - 39)	35 - 65 (19 - 36)	40 - 70 (22 - 39)	35 - 65 (19 - 36)	35 - 65 (19 - 36)	35 - 65 (19 - 36)	40 - 70 (22 - 39)	40 - 70 (22 - 39)	45 - 75 (25 - 42)
Airflow Capacity and Blower Data			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20
Rated External Static Pressure (in. W.C.)	Heating		0.10	0.10	0.12	0.12	0.15	0.15	0.20	0.20	0.20
	Cooling		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Airflow Delivery @ Rated ESP (CFM)	High Heat		910	980	910	980	1030	1115	1480	1550	2070
	Cooling		970	1140	1155	1505	1555	1885	1490	1970	2050
Cooling Capacity (tons)	400 CFM/ ton		2.5	2.5	2.5	3.5	4	4.5	3.5	5	5
	350 CFM/ ton		2.5	3	3	4	4.5	5.0	4	5.5	5.5
Direct-Drive Motor Type			Permanent Split Capacitor (PSC)								
Direct-Drive Motor HP			0.3	0.5	0.3	0.5	0.5	0.75	0.5	0.75	0.75
Motor Full Load Amps			4.6	6.8	4.6	7.9	7.4	7.9	6.5	11.1	11.1
RPM Range			500 - 1150								
Speed Selections			4	5	4	4	5	5	4	4	4
Blower Wheel Dia x Width	in.		11 x 7	11 x 8	11 x 7	11 x 8	11 x 8	11 x 10	11 x 10	11 x 10	11 x 11
Air Filtration System			Field Supplied								
Filter Used for Certified Watt Data*			KGAWF**D6UFR								
Electrical Data			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20
Input Voltage	Volts-Hertz-Phase		115-60-1								
Operating Voltage Range	Min-Max		104 - 127								
Maximum Input Amps	Amps		5.2	7.4	5.3	8.6	8.1	8.6	7.3	11.9	11.9
Unit Ampacity	Amps		7.5	10.3	7.6	11.7	11.1	11.7	10.1	15.8	15.8
Minimum Wire Size	AWG		14	14	14	14	14	14	14	12	12
Maximum Wire Length @ Minimum Wire Size	Feet		49	36	48	31	33	31	36	36	36
	(M)		(14.9)	(11.0)	(14.6)	(9.4)	(10.1)	(9.4)	(11.0)	(11.0)	(11.0)
Maximum Fuse/Ckt Bkr (Time-Delay Type Recommended)	Amps		15	15	15	15	15	15	15	20	20
Transformer Capacity (24vac output)			40 VA								
External Control Power Available	Heating		27.9 VA								
	Cooling		34.6 VA								
Controls			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20
Gas Connection Size			1/2" - NPT								
Burners (Monoport)			2	2	3	3	4	4	5	5	6
Gas Valve (Redundant)			White Rodgers								
Minimum Inlet Gas pressure (in. W.C.)			4.5								
Maximum Inlet Gas pressure (in. W.C.)			13.6								
Ignition Device			Silicon Nitride								
Limit Control			195	180	220	190	185	195	220	220	165
Heating Blower Control (Heating Off-Delay)			Adjustable: 90, 120, 150, 180 seconds								
Cooling Blower Control (Time Delay Relay)			90 seconds								
Communication System			none								
Thermostat Connections			Com 24V, R, W, G, Y								
Accessory Connections			EAC (115vac); HUM (24vac)								
* See Accessory List for part numbers available.											



Fan Performance

AIR DELIVERY - CFM (BOTTOM RETURN WITH FILTER)

Furnace	Return Air Connection	Wire Lead Color	Cooling Tons	CFM / Ton	Test Airflow Delivery @ Various External Static Pressures									
					0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
040-10	SIDE/BOTTOM	Black	2.5	388	1145	1100	1060	1015	970	920	860	785	680	615
		Blue	2.0	413	970	940	905	870	825	775	730	675	570	505
		Yellow	2.0	385	910	880	845	810	770	725	675	600	535	475
		Red	1.5	397	725	695	665	635	595	555	510	460	390	340
060-12	SIDE/BOTTOM	Black	3.0	385	1215	1205	1205	1195	1155	1100	1045	975	910	805
		Blue	2.5	370	980	985	980	955	925	880	835	780	695	585
		Yellow	2.0	425	910	920	905	880	850	815	765	695	630	545
		Red ³	1.5	430	750	730	705	680	645	605	555	490	435	370
040-12	SIDE/BOTTOM	Black	3.0	380	1365	1310	1255	1200	1140	1080	1015	950	860	795
		Yellow	2.5	418	1245	1200	1150	1100	1045	990	930	855	790	730
		Orange	2.5	366	1050	1025	985	950	915	870	820	760	705	655
		Blue	2.0	435	980	955	935	905	870	830	780	725	675	625
		Red	1.5	437	720	705	690	675	655	625	590	555	525	485
060-16	SIDE/BOTTOM	Black	4.0	376	1600	1545	1505	1475	1505	1445	1400	1330	1235	1140
		Yellow	3.5	377	1380	1340	1335	1330	1320	1285	1225	1155	1085	1000
		Blue ³	3.0	387	1190	1185	1195	1195	1160	1125	1075	1015	950	885
		Red ³	2.5	394	1030	1025	1030	1010	985	940	905	855	805	735
080-16	SIDE/BOTTOM	Black	4.0	389	1650	1620	1640	1605	1555	1495	1425	1345	1255	1165
		Yellow	3.5	381	1420	1425	1400	1370	1335	1290	1230	1170	1095	1015
		Orange	3.0	383	1205	1205	1185	1165	1150	1100	1055	1000	935	870
		Blue	2.5	384	1035	1020	1005	985	960	930	895	845	795	735
		Red	2.0	380	850	825	805	785	760	725	695	655	600	545
080-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	377	2225	2160	2070	1980	1885	1790	1690	1575	1460	1345
		Yellow	4.0	386	1690	1665	1640	1595	1545	1485	1410	1330	1235	1135
		Orange	3.5	397	1485	1470	1455	1430	1390	1340	1280	1205	1120	1035
		Blue ³	2.5	426	1120	1110	1100	1090	1065	1035	990	935	870	805
		Red ³	2.0	433	940	920	910	890	865	830	790	745	690	625
100-16	SIDE/BOTTOM	Black	4.0	373	1715	1660	1610	1555	1490	1420	1340	1245	1150	1065
		Yellow ³	3.5	379	1535	1480	1435	1380	1325	1260	1180	1095	1010	910
		Blue ³	3.0	367	1300	1255	1205	1160	1100	1035	970	905	810	730
		Red ³	2.0	445	1110	1055	1005	955	890	835	770	690	610	535
100-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	394	2270	2205	2130	2055	1970	1880	1780	1670	1555	1425
		Yellow	5.0	367	2090	2040	1980	1910	1835	1755	1670	1570	1460	1340
		Blue	4.0	416	1850	1815	1775	1725	1665	1600	1525	1435	1335	1225
		Red	3.5	421	1580	1550	1540	1515	1475	1420	1355	1280	1190	1100
120-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	410	2385	2310	2230	2150	2050	1920	1780	1650	1540	1415
		Yellow	5.0	369	2130	2070	2010	1940	1845	1740	1630	1525	1420	1305
		Blue	4.0	416	1875	1840	1795	1735	1665	1580	1495	1410	1310	1205
		Red ³	3.5	414	1610	1585	1555	1515	1450	1395	1325	1250	1160	1080



Coil Performance Data

PERFORMANCE DATA (cont.)

COIL STATIC PRESSURE DROP (in. w.c.) PURON and R-22 REFRIGERANTS

UNIT SIZE	Standard CFM																	
	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100
1814	Dry																	
	0.078	0.114	0.156	0.198	0.253													
1917	Wet																	
	0.096	0.138	0.183	0.213	0.277													
2414	Dry																	
	0.042	0.060	0.080	0.102	0.128													
2417	Wet																	
	0.055	0.076	0.104	0.127	0.158													
3014	Dry																	
	0.070	0.103	0.143	0.182	0.233	0.290	0.354											
3017	Wet																	
	0.089	0.128	0.171	0.214	0.269	0.336	0.413											
3117	Dry																	
	0.048	0.068	0.090	0.112	0.140	0.170	0.203											
3177	Wet																	
	0.064	0.091	0.122	0.150	0.188	0.224	0.263											
3617	Dry																	
	0.065	0.097	0.135	0.173	0.223	0.278	0.339	0.405	0.478									
T3617	Wet																	
	0.078	0.114	0.160	0.206	0.260	0.321	0.388	0.461	0.540									
3621	Dry																	
	0.042	0.060	0.080	0.102	0.128	0.157	0.188	0.222	0.259									
3717	Wet																	
	0.055	0.076	0.104	0.127	0.158	0.190	0.225	0.266	0.309									
4217	Dry																	
	0.031	0.046	0.063	0.083	0.105	0.130	0.156	0.193	0.230									
T4217	Wet																	
	0.039	0.056	0.075	0.097	0.121	0.149	0.179	0.212	0.249									
4221	Dry																	
	0.043	0.061	0.082	0.103	0.128	0.157	0.189	0.221	0.259	0.299	0.341							
T4221	Wet																	
	0.056	0.079	0.107	0.133	0.166	0.200	0.236	0.276	0.315	0.361	0.413							
4324	Dry																	
	0.035	0.048	0.062	0.076	0.093	0.111	0.132	0.153	0.177	0.201	0.228							
4821	Wet																	
	0.049	0.066	0.085	0.100	0.122	0.144	0.171	0.192	0.217	0.245	0.276							
T4821	Dry																	
	0.025	0.038	0.054	0.072	0.093	0.117	0.143	0.171	0.205	0.233	0.273							
4824	Wet																	
	0.030	0.044	0.061	0.079	0.103	0.125	0.154	0.182	0.216	0.251	0.288							
T4824	Dry																	
			0.072	0.093	0.118	0.145	0.175	0.206	0.243	0.281	0.322	0.366	0.413					
6024	Wet																	
			0.079	0.102	0.130	0.159	0.192	0.228	0.26	0.303	0.348	0.396	0.446					
T6024	Dry																	
	0.030	0.041	0.054	0.066	0.082	0.099	0.118	0.137	0.158	0.180	0.205	0.231	0.259					
6124	Wet																	
	0.043	0.059	0.078	0.101	0.126	0.153	0.181	0.207	0.234	0.260	0.288	0.319	0.354					
T6124	Dry																	
			0.053	0.062	0.073	0.084	0.097	0.111	0.126	0.138	0.154	0.172	0.190	0.210				
T6124	Wet																	
			0.067	0.082	0.096	0.112	0.129	0.145	0.163	0.171	0.191	0.212	0.235	0.258				
T6124	Dry																	
			0.047	0.060	0.075	0.092	0.110	0.130	0.152	0.176	0.204	0.230	0.256	0.284	0.318			
T6124	Wet																	
			0.053	0.067	0.085	0.104	0.125	0.147	0.172	0.200	0.228	0.259	0.292	0.327	0.365			
T6124	Dry																	
			0.015	0.046	0.057	0.069	0.094	0.100	0.119	0.124	0.140	0.158	0.175	0.195	0.214			
T6124	Wet																	
			0.032	0.050	0.066	0.081	0.097	0.114	0.131	0.150	0.169	0.190	0.211	0.233	0.257			
T6124	Dry																	
					0.062	0.073	0.084	0.097	0.111	0.126	0.138	0.154	0.172	0.190	0.210	0.228	0.251	0.273
T6124	Wet																	
					0.082	0.096	0.112	0.129	0.145	0.163	0.171	0.191	0.212	0.235	0.258	0.283	0.310	0.336
T6124	Dry																	
											0.130	0.140	0.160	0.180	0.200	0.220	0.240	0.270
T6124	Wet																	
											0.150	0.170	0.190	0.210	0.230	0.260	0.290	0.310

CNPU / CNRV



Condenser Specs

EVAPORATOR AIR		CONDENSER ENTERING AIR								
		75 (23.9)			85 (29.4)			95 (35)		
CFM	EWB ° F (° C)	Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**
		Total	Sens±		Total	Sens±		Total	Sens±	
24ABB342										
1225	72 (22.2)	48.49	25.49	3.39	46.39	24.69	3.73	44.18	23.85	4.11
	67 (19.4)	44.47	31.36	3.33	42.52	30.54	3.67	40.46	29.67	4.05
	63 (17.2)††	41.53	30.43	3.29	39.69	29.59	3.63	37.74	28.72	4.01
	62 (16.7)	40.83	37.19	3.28	39.07	36.35	3.63	37.22	35.45	4.00
	57 (13.9)	39.73	39.73	3.27	38.29	38.29	3.62	36.76	36.76	4.00
1400	72 (22.2)	49.21	26.62	3.47	47.02	25.80	3.81	44.73	24.95	4.19
	67 (19.4)	45.16	33.20	3.42	43.14	32.37	3.76	41.00	31.49	4.13
	63 (17.2)††	42.22	32.16	3.38	40.31	31.31	3.72	38.28	30.42	4.09
	62 (16.7)	41.69	39.75	3.37	39.91	38.85	3.71	38.02	38.02	4.09
	57 (13.9)	41.25	41.25	3.37	39.72	39.72	3.71	38.08	38.08	4.09
1575	72 (22.2)	49.75	27.70	3.56	47.50	26.88	3.90	45.14	26.02	4.27
	67 (19.4)	45.69	34.99	3.50	43.64	34.15	3.84	41.42	33.28	4.22
	63 (17.2)††	42.75	33.85	3.46	40.79	33.00	3.80	38.72	32.11	4.17
	62 (16.7)	42.52	42.08	3.46	40.87	40.87	3.80	39.14	39.14	4.18
	57 (13.9)	42.49	42.49	3.46	40.87	40.87	3.80	39.15	39.15	4.18

Total Gain From Manual J=28645

Sensible Capacity of AC above: 32110 Sensible

$28645/32110 = .89$ or 11% Over



Equipment: System 3-Main Floor-Right Side

Furnace: Carrier Model # 59SC2C040S17--12 (40000 BTU)

Coil: Carrier Model # CNPV*2417AL*+TDR (2 Ton)

Condenser: Carrier Model # 24ABB318ABN34* (1.5 ton)

Notes: Static pressure available values for return ducts are at the entrance of the duct. For supply, they are at the exit. The cumulative static pressure loss value for a return trunk is with respect to the entry point of the return runout upstream with the highest static pressure available. Total and cumulative static pressure loss values for the supply main trunk include any device pressure losses entered, and the cumulative may also include the total static pressure loss of the return side.

Summary

Number of active trunks:	10		
Number of active runouts:	9		
Total runout outlet airflow:	679		
Main trunk airflow:	677		
Largest trunk diameter:	13.7	ST-550	
Largest runout diameter:	6	SR-460	
Smallest trunk diameter:	12	ST-580	
Smallest runout diameter:	5	SR-540	
Supply fan external static pressure:	0.800		
Supply fan device pressure losses:	0.172		
Supply fan static pressure available:	0.628		
Runout maximum cumulative static pressure loss:	0.351	SR-490	
Return loss added to supply:	0.089		
Total effective length of return (ft.):	279.0	Master 1 High	
Total effective length of supply (ft.):	197.4	SR-490	
Overall total effective length (ft.):	476.4	Master 1 High to SR-490	
Design overall friction rate per 100 ft.:	0.132	(Available SP x 100 / TEL)	
System duct surface area (Scenario 1):	340.3	Main	(Linked to duct load)
Total system duct surface area:	340.3		



Furnace Info

Heat Rise Used 60 Degrees

SPECIFICATIONS

Heating Capacity and Efficiency			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20
Input	High Heat	(BTUH)	40,000	40,000	60,000	60,000	80,000	80,000	100,000	100,000	120,000
Output	High Heat	(BTUH)	37,000	37,000	56,000	56,000	75,000	75,000	93,000	93,000	112,000
Certified Temperature Rise Range	High Heat	°F (°C)	40-70 (22 - 39)	35 - 65 (19 - 36)	40 - 70 (22 - 39)	35 - 65 (19 - 36)	35 - 65 (19 - 36)	35 - 65 (19 - 36)	40 - 70 (22 - 39)	40 - 70 (22 - 39)	45 - 75 (25 - 42)
Airflow Capacity and Blower Data			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20
Rated External Static Pressure (in. W.C.)	Heating		0.10	0.10	0.12	0.12	0.15	0.15	0.20	0.20	0.20
	Cooling		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Airflow Delivery @ Rated ESP (CFM)	High Heat		910	980	910	980	1030	1115	1480	1550	2070
	Cooling		970	1140	1155	1505	1555	1885	1490	1970	2050
Cooling Capacity (tons)	400 CFM/ ton		2.5	2.5	2.5	3.5	4	4.5	3.5	5	5
	350 CFM/ ton		2.5	3	3	4	4.5	5.0	4	5.5	5.5
Direct-Drive Motor Type	Permanent Split Capacitor (PSC)										
Direct-Drive Motor HP			0.3	0.5	0.3	0.5	0.5	0.75	0.5	0.75	0.75
Motor Full Load Amps			4.6	6.8	4.6	7.9	7.4	7.9	6.5	11.1	11.1
RPM Range	500 - 1150										
Speed Selections			4	5	4	4	5	5	4	4	4
Blower Wheel Dia x Width	in.		11 x 7	11 x 8	11 x 7	11 x 8	11 x 8	11 x 10	11 x 10	11 x 10	11 x 11
Air Filtration System	Field Supplied										
Filter Used for Certified Watt Data*	KGAWF**06UFR										
Electrical Data			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20
Input Voltage	Volts-Hertz-Phase		115-60-1								
Operating Voltage Range	Min-Max		104 - 127								
Maximum Input Amps	Amps		5.2	7.4	5.3	8.6	8.1	8.6	7.3	11.9	11.9
Unit Ampacity	Amps		7.5	10.3	7.6	11.7	11.1	11.7	10.1	15.8	15.8
Minimum Wire Size	AWG		14	14	14	14	14	14	14	12	12
Maximum Wire Length @ Minimum Wire Size	Feet (M)		49 (14.9)	36 (11.0)	48 (14.6)	31 (9.4)	33 (10.1)	31 (9.4)	36 (11.0)	36 (11.0)	36 (11.0)
Maximum Fuse/CKT Bkr (Time-Delay Type Recommended)	Amps		15	15	15	15	15	15	15	20	20
Transformer Capacity (24vac output)			40 VA								
External Control Power Available	Heating		27.9 VA								
	Cooling		34.6 VA								
Controls			040-10	040-12	060-12	060-16	080-16	080-20	100-16	100-20	120-20
Gas Connection Size	1/2" - NPT										
Burners (Monoport)			2	2	3	3	4	4	5	5	6
Gas Valve (Redundant)	Manufacturer		White Rodgers								
	Minimum Inlet Gas pressure (in. W.C.)		4.5								
	Maximum Inlet Gas pressure (in. W.C.)		13.6								
Ignition Device	Silicon Nitride										
Limit Control			195	180	220	190	185	195	220	220	165
Heating Blower Control (Heating Off-Delay)	Adjustable: 90, 120, 150, 180 seconds										
Cooling Blower Control (Time Delay Relay)	90 seconds										
Communication System	none										
Thermostat Connections	Com 24V, R, W, G, Y										
Accessory Connections	EAC (115vac); HUM (24vac)										

* See Accessory List for part numbers available.



Fan Performance

AIR DELIVERY - CFM (BOTTOM RETURN WITH FILTER)

Furnace	Return Air Connection	Wire Lead Color	Cooling Tons	CFM / Ton	Test Airflow Delivery @ Various External Static Pressures									
					0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
040-10	SIDE/BOTTOM	Black	2.5	388	1145	1100	1060	1015	970	920	860	785	680	615
		Blue	2.0	413	970	940	905	870	825	775	730	675	570	505
		Yellow	2.0	385	910	880	845	810	770	725	675	600	535	475
		Red	1.5	397	725	695	665	635	595	555	510	460	390	340
060-12	SIDE/BOTTOM	Black	3.0	385	1215	1205	1205	1195	1155	1100	1045	975	910	805
		Blue	2.5	370	980	985	980	955	925	880	835	780	695	585
		Yellow	2.0	425	910	920	905	880	850	815	765	695	630	545
		Red ³	1.5	430	750	730	705	680	645	605	555	490	435	370
040-12	SIDE/BOTTOM	Black	3.0	380	1365	1310	1255	1200	1140	1080	1015	950	860	795
		Yellow	2.5	418	1245	1200	1150	1100	1045	990	930	855	790	730
		Orange	2.5	366	1050	1025	985	950	915	870	820	760	705	655
		Blue	2.0	435	980	955	935	905	870	830	780	725	675	625
		Red	1.5	437	720	705	690	675	655	625	590	555	525	485
060-16	SIDE/BOTTOM	Black	4.0	376	1600	1545	1505	1475	1505	1445	1400	1330	1235	1140
		Yellow	3.5	377	1380	1340	1335	1330	1320	1285	1225	1155	1085	1000
		Blue ³	3.0	387	1190	1185	1195	1195	1160	1125	1075	1015	950	885
		Red ³	2.5	394	1030	1025	1030	1010	985	940	905	855	805	735
080-16	SIDE/BOTTOM	Black	4.0	389	1650	1620	1640	1605	1555	1495	1425	1345	1255	1165
		Yellow	3.5	381	1420	1425	1400	1370	1335	1290	1230	1170	1095	1015
		Orange	3.0	383	1205	1205	1185	1165	1150	1100	1055	1000	935	870
		Blue	2.5	384	1035	1020	1005	985	960	930	895	845	795	735
		Red	2.0	380	850	825	805	785	760	725	695	655	600	545
080-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	377	2225	2160	2070	1980	1885	1790	1690	1575	1460	1345
		Yellow	4.0	386	1690	1665	1640	1595	1545	1485	1410	1330	1235	1135
		Orange	3.5	397	1485	1470	1455	1430	1390	1340	1280	1205	1120	1035
		Blue ³	2.5	426	1120	1110	1100	1090	1065	1035	990	935	870	805
		Red ³	2.0	433	940	920	910	890	865	830	790	745	690	625
100-16	SIDE/BOTTOM	Black	4.0	373	1715	1660	1610	1555	1490	1420	1340	1245	1150	1065
		Yellow ³	3.5	379	1535	1480	1435	1380	1325	1260	1180	1095	1010	910
		Blue ³	3.0	367	1300	1255	1205	1160	1100	1035	970	905	810	730
		Red ³	2.0	445	1110	1055	1005	955	890	835	770	690	610	535
100-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	394	2270	2205	2130	2055	1970	1880	1780	1670	1555	1425
		Yellow	5.0	367	2090	2040	1980	1910	1835	1755	1670	1570	1460	1340
		Blue	4.0	416	1850	1815	1775	1725	1665	1600	1525	1435	1335	1225
		Red	3.5	421	1580	1550	1540	1515	1475	1420	1355	1280	1190	1100
120-20	BOTTOM or TWO-SIDES ^{4,5}	Black	5.0	410	2385	2310	2230	2150	2050	1920	1780	1650	1540	1415
		Yellow	5.0	369	2130	2070	2010	1940	1845	1740	1630	1525	1420	1305
		Blue	4.0	416	1875	1840	1795	1735	1665	1580	1495	1410	1310	1205
		Red ³	3.5	414	1610	1585	1555	1515	1450	1395	1325	1250	1160	1080



Coil Performance Data

PERFORMANCE DATA (cont.)

COIL STATIC PRESSURE DROP (in. w.c.) PURON and R-22 REFRIGERANTS

UNIT SIZE	Standard CFM																		
	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200
1814	Dry																		
	0.078	0.114	0.156	0.198	0.253														
1917	Wet																		
	0.096	0.138	0.183	0.213	0.277														
2414	Dry																		
	0.042	0.060	0.080	0.102	0.128														
2414	Wet																		
	0.055	0.076	0.104	0.127	0.158														
2417	Dry																		
	0.070	0.103	0.143	0.182	0.233	0.290	0.354												
2417	Wet																		
	0.089	0.128	0.171	0.214	0.269	0.336	0.413												
3014	Dry																		
	0.048	0.068	0.090	0.112	0.140	0.170	0.203												
3014	Wet																		
	0.064	0.091	0.122	0.150	0.188	0.224	0.263												
3017	Dry																		
	0.065	0.097	0.135	0.173	0.223	0.278	0.339	0.405	0.478										
3017	Wet																		
	0.078	0.114	0.160	0.206	0.260	0.321	0.388	0.461	0.540										
3117	Dry																		
	0.042	0.060	0.080	0.102	0.128	0.157	0.188	0.222	0.259										
3117	Wet																		
	0.055	0.076	0.104	0.127	0.158	0.190	0.225	0.266	0.309										
3617	Dry																		
	0.031	0.046	0.063	0.083	0.105	0.130	0.156	0.193	0.230										
3617	Wet																		
	0.039	0.056	0.075	0.097	0.121	0.149	0.179	0.212	0.249										
T3617	Dry																		
	0.043	0.061	0.082	0.103	0.128	0.157	0.189	0.221	0.259	0.299	0.341								
3621	Wet																		
	0.056	0.079	0.107	0.133	0.166	0.200	0.236	0.276	0.315	0.361	0.413								
3717	Dry																		
	0.035	0.048	0.062	0.076	0.093	0.111	0.132	0.153	0.177	0.201	0.228								
3717	Wet																		
	0.049	0.066	0.085	0.100	0.122	0.144	0.171	0.192	0.217	0.245	0.276								
4217	Dry																		
	0.025	0.038	0.054	0.072	0.093	0.117	0.143	0.171	0.205	0.233	0.273								
4217	Wet																		
	0.030	0.044	0.061	0.079	0.103	0.125	0.154	0.182	0.216	0.251	0.288								
4221	Dry																		
			0.072	0.093	0.118	0.145	0.175	0.206	0.243	0.281	0.322	0.366	0.413						
T4221	Wet																		
			0.079	0.102	0.130	0.159	0.192	0.228	0.26	0.303	0.348	0.396	0.446						
4324	Dry																		
	0.030	0.041	0.054	0.066	0.082	0.099	0.118	0.137	0.158	0.180	0.205	0.231	0.259						
4324	Wet																		
	0.043	0.059	0.078	0.101	0.126	0.153	0.181	0.207	0.234	0.260	0.288	0.319	0.354						
4821	Dry																		
			0.053	0.062	0.073	0.084	0.097	0.111	0.126	0.138	0.154	0.172	0.190	0.210					
T4821	Wet																		
			0.067	0.082	0.096	0.112	0.129	0.145	0.163	0.171	0.191	0.212	0.235	0.258					
4824	Dry																		
			0.047	0.060	0.075	0.092	0.110	0.130	0.152	0.176	0.204	0.230	0.256	0.284	0.318				
6024	Wet																		
			0.053	0.067	0.085	0.104	0.125	0.147	0.172	0.200	0.228	0.259	0.292	0.327	0.365				
T6024	Dry																		
			0.015	0.046	0.057	0.069	0.094	0.100	0.119	0.124	0.140	0.158	0.175	0.195	0.214				
6124	Wet																		
			0.032	0.050	0.066	0.081	0.097	0.114	0.131	0.150	0.169	0.190	0.211	0.233	0.257				
T6124	Dry																		
					0.062	0.073	0.084	0.097	0.111	0.126	0.138	0.154	0.172	0.190	0.210	0.228	0.251	0.273	0.293
	Wet																		
					0.082	0.096	0.112	0.129	0.145	0.163	0.171	0.191	0.212	0.235	0.258	0.283	0.310	0.336	0.366
	Dry																		
										0.130	0.140	0.160	0.180	0.200	0.220	0.240	0.270	0.290	
	Wet																		
										0.150	0.170	0.190	0.210	0.230	0.260	0.290	0.310	0.340	

CNRY / CNRV



Condenser Specs

EVAPORATOR AIR		CONDENSER ENTERING AIR TEMPERA									
CFM	EWB ° F (° C)	75 (23.9)			85 (29.4)			95 (35)		Total System KW**	Capacit
		Capacity MBtuh		Total System KW**	Capacity MBtuh		Total System KW**	Capacity MBtuh			
		Total	Sens†		Total	Sens†		Total	Sens†		
24ABB318											
525	72 (22.2)	20.79	10.51	1.27	19.89	10.18	1.42	18.93	9.83	1.58	17.94
	67 (19.4)	19.09	12.93	1.27	18.24	12.58	1.42	17.33	12.21	1.59	16.39
	63 (17.2)††	17.84	12.55	1.27	17.02	12.19	1.42	16.15	11.82	1.59	15.24
	62 (16.7)	17.53	15.32	1.27	16.74	14.95	1.42	15.91	14.57	1.59	15.04
	57 (13.9)	17.00	17.00	1.27	16.36	16.36	1.42	15.67	15.67	1.59	14.95
600	72 (22.2)	21.12	11.01	1.29	20.19	10.67	1.44	19.19	10.32	1.61	18.18
	67 (19.4)	19.42	13.74	1.29	18.54	13.39	1.45	17.60	13.02	1.61	16.63
	63 (17.2)††	18.17	13.32	1.30	17.32	12.96	1.45	16.43	12.58	1.62	15.49
	62 (16.7)	17.93	16.44	1.30	17.12	16.06	1.45	16.30	16.21	1.62	15.53
	57 (13.9)	17.70	17.70	1.30	17.02	17.02	1.45	16.29	16.29	1.62	15.53
675	72 (22.2)	21.35	11.48	1.32	20.39	11.14	1.47	19.37	10.79	1.64	18.34
	67 (19.4)	19.66	14.52	1.32	18.76	14.17	1.47	17.79	13.80	1.64	16.81
	63 (17.2)††	18.41	14.06	1.32	17.55	13.70	1.48	16.63	13.31	1.64	15.67
	62 (16.7)	18.28	18.11	1.32	17.55	17.55	1.48	16.79	16.79	1.64	15.99
	57 (13.9)	18.26	18.26	1.32	17.55	17.55	1.48	16.79	16.79	1.64	15.99

Total Gain From Manual J=12016

Sensible Capacity of AC above: 13310 Sensible

$12016/13310 = .90$ or 10% Over