

SYSTEM A												
Loop/ Segment	Load (mbh)	Line Length	Refrig. (lb's)	LIQUID				VAPOR				
				Pipe Size	Temperature	Drop (F)	Pipe Size	Temperature	Drop (F)			
Main Liquid (Sheet R1.3)		# Designates valve location										
AL1	146.1	6	2.3	1 1/8	0.0	0.0						
AL2R	146.1	6	2.3	1 1/8	0.0	0.4						
AL3	146.1	63	24.1	1 1/8	-0.2	-0.2						
AL4R	146.1	8	3.1	1 1/8	0.0	-0.2						
AL5R	146.1	8	2.0	7/8	0.0	-0.2						
AL6	146.1	2	0.5	7/8	0.0	-0.2						
AL6S	106.4	18	4.0	7/8	-0.1	-0.3						
AL6A	146.1	16	3.5	1 1/2	0.0	-0.3						
AL6SR	3.1	20	1.3	1/2	0.0	-0.3						
AL6S	103.3	17	4.3	7/8	0.0	-0.3						
AL67	26.6	62	7.6	1 1/2	0.0	-0.4						
AL68R	16.0	13	1.0	1/2	0.0	-0.4						
AL69R	10.7	13	1.0	1/2	0.0	-0.4						
AL6R	76.6	19	4.8	7/8	0.0	-0.3						
AL61	14.4	18	1.4	1/2	0.0	-0.3						
AL62R	14.4	20	1.5	1/2	0.0	-0.3						
AL63	62.2	13	1.6	5/8	-0.1	-0.4						
AL64	26.1	46	3.5	1/2	-0.2	-0.6						
AL65R	4.8	13	1.0	1/2	0.0	-0.6						
AL66R	2.1	13	1.0	1/2	0.0	-0.6						
AL67	19.2	16	2.0	5/8	0.0	-0.6						
AL68R	17.0	13	1.0	1/2	0.0	-0.6						
AL69R	2.1	13	1.0	1/2	0.0	-0.6						
AL7R	36.2	62	8.4	1 1/2	0.0	-0.6						
AL71R	11.5	10	0.8	1/2	0.0	-0.6						
AL72	24.7	36	4.4	5/8	0.0	-0.6						
AL73R	24.7	10	1.2	5/8	0.0	-0.6						
AL74	39.7	65	16.5	7/8	0.0	-0.2						
AL75	9.1	16	2.0	5/8	0.0	-0.2						
AL76R	3.8	13	1.0	1/2	0.0	-0.2						
AL77R	5.3	13	1.0	1/2	0.0	-0.2						
AL78	30.6	21	2.6	5/8	0.0	-0.2						
AL79	5.0	4	0.3	1/2	0.0	-0.2						
AL80R	5.0	20	1.5	1/2	0.0	-0.2						
AL81	25.6	8	1.0	5/8	0.0	-0.2						
AL82	17.9	9	0.7	1/2	0.0	-0.2						
AL83R	17.9	10	0.8	1/2	0.0	-0.2						
AL84	7.7	124	9.4	1/2	-0.1	-0.3						
AL85R	7.7	10	0.8	1/2	0.0	-0.3						
Main Suction (Sheet R1.3) # Designates valve location												
AS1R	146.1	8	0.1				2 1/8	-0.3	-0.3			
AS2	146.1	2	0.0				2 1/8	-0.1	-0.4			
AS3	106.4	16	0.2				2 1/8	-0.3	-0.7			
AS4	3.1	6	0.0				5/8	-0.1	-0.8			
AS5R	3.1	20	0.0				5/8	-0.4	-1.2			
AS6	103.3	17	0.2				2 1/8	-0.2	-1.2			
AS7	26.6	62	0.3				1 5/8	-0.4	-1.4			
AS8R	16.0	13	0.0				1 1/8	-0.2	-1.6			
AS8R	10.7	13	0.0				7/8	-0.4	-1.8			
AS9	76.6	18	1.8				2 1/8	-0.2	-1.2			
AS10	14.4	17	0.0				1 1/8	-0.2	-1.4			
AS12R	14.4	20	0.0				7/8	-1.0	-2.4			
AS13	62.2	13	0.1				1 5/8	-0.4	-1.6			
AS14	26.1	46	0.2				1 5/8	-0.3	-1.9			
AS15R	4.8	13	0.0				5/8	-0.5	-2.4			
AS16R	2.1	13	0.0				1/2	-0.4	-2.3			
AS17	19.2	16	1.3				1 3/8	-0.1	-2.0			
AS18R	17.0	13	0.0				1/2	-0.4	-2.2			
AS19R	2.1	13	0.0				1/2	-0.4	-2.2			
AS20	36.2	55	0.3				1 5/8	-0.6	-2.2			
AS21R	11.5	10	0.0				7/8	-0.3	-2.5			
AS22	24.7	36	0.1				1 3/8	-0.5	-2.7			
AS23R	24.7	10	0.0				1 3/8	-0.1	-2.8			
AS24	39.7	65	0.4				1 5/8	-0.8	-1.2			
AS25	9.1	15	0.0				1 1/8	-0.1	-1.3			
AS26R	3.8	13	0.0				5/8	-0.3	-1.6			
AS27R	5.3	13	0.0				5/8	-0.6	-1.9			
AS28	30.6	20	0.1				1 3/8	-0.4	-1.6			
AS29	5.0	3	0.0				5/8	-0.1	-1.7			
AS30R	5.0	20	0.0				5/8	-0.6	-2.6			
AS31	25.6	9	0.0				1 1/8	-0.3	-1.9			
AS32	17.9	9	0.0				1 1/8	-0.2	-2.1			
AS33R	17.9	10	0.0				1 1/8	-0.2	-2.3			
AS34	7.7	121	0.3				1 1/8	-0.4	-2.3			
AS35R	7.7	10	0.0				7/8	-0.2	-2.5			
Underfloor (Sheet R1.2)												
NONE												
Case/Cooler Top & Case To Case (Sheet R1.4) # Designates factory top piping by OEM, # Designates valve location												
AC1	3.1	8	0.6	1/2	0.0	-0.3	5/8	-0.2	-1.4			
AC2	14.4	1	0.1	1/2	0.0	-0.3	1 1/8	0.0	-2.4			
AC3	7.2	2	0.2	1/2	0.0	-0.3	7/8	0.0	-2.4			
AC4	16.0	5	0.4	1/2	0.0	-0.4	1 1/8	-0.1	-1.7			
AC5R	16.0	7	0.6	1/2	0.0	-0.4	1 1/8	-0.1	-1.8			
AC6	16.0	1	0.1	1/2	0.0	-0.4	1 1/8	0.0	-1.8			
AC7	10.7	12	0.9	1/2	0.0	-0.4	7/8	-0.4	-2.2			
AC8	5.3	12	0.9	1/2	0.0	-0.4	5/8	-0.6	-2.8			
AC9	10.7	14	1.1	1/2	0.0	-0.4	7/8	-0.4	-2.2			
AC10R	10.7	7	0.5	1/2	0.0	-0.4	7/8	-0.2	-2.4			
AC11	10.7	2	0.2	1/2	0.0	-0.4	7/8	-0.1	-2.5			
AC12	5.3	13	1.0	1/2	0.0	-0.4	7/8	-0.1	-2.6			
AC13	4.8	18	1.4	1/2	0.0	-0.6	7/8	-0.1	-2.5			
AC14R	4.8	7	0.5	1/2	0.0	-0.6	5/8	-0.3	-2.8			
AC15	4.8	1	0.1	1/2	0.0	-0.6	7/8	0.0	-2.8			
AC16	2.1	34	2.6	1/2	0.0	-0.6	5/8	-0.3	-2.6			
AC17R	2.1	7	0.5	1/2	0.0	-0.6	1/2	-0.2	-2.8			
AC18	2.1	2	0.2	1/2	0.0	-0.6	5/8	0.0	-2.8			
AC19	17.0	7	0.6	1/2	0.0	-0.6	1 1/8	-0.1	-2.3			
AC20R	17.0	7	0.6	1/2	0.0	-0.6	1 1/8	-0.1	-2.4			
AC21	17.0	2	0.2	1/2	0.0	-0.6	1 1/8	0.0	-2.4			
AC22	11.7	13	0.6	3/8	-0.1	-0.7	7/8	-0.4	-2.8			
AC23	6.4	8	0.3	3/8	0.0	-0.7	7/8	-0.1	-2.9			
AC24	3.2	8	0.3	3/8	0.0	-0.7	5/8	-0.1	-3.0			
AC25	2.1	34	2.6	1/2	0.0	-0.6	5/8	-0.3	-2.7			
AC26R	2.1	7	0.5	1/2	0.0	-0.6	1/2	-0.2	-2.9			
AC27	2.1	2	0.2	1/2	0.0	-0.6	5/8	0.0	-2.9			
AC28R	11.5	2	0.2	1/2	0.0	-0.6	7/8	-0.1	-2.6			
AC29R	5.7	2	0.2	1/2	0.0	-0.6	5/8	-0.1	-2.7			
AC30	5.7	7	0.5	1/2	0.0	-0.6	5/8	-0.3	-2.9			
AC31R	5.7	2	0.2	1/2	0.0	-0.6	5/8	-0.1	-3.0			
AC32	24.7	2	0.3	5/8	0.0	-0.6	1 3/8	0.0	-2.8			
AC33R	24.7	2	0.3	5/8	0.0	-0.6	1 3/8	0.0	-2.8			
AC34	3.8	5	0.4	1/2	0.0	-0.2	5/8	-0.1	-1.7			
AC35R	3.8	7	0.5	1/2	0.0	-0.2	5/8	-0.2	-1.9			
AC36	3.8	2	0.2	1/2	0.0	-0.2	5/8	0.0	-1.9			
AC37	5.3	11	0.8	1/2	0.0	-0.2	5/8	-0.5	-2.4			
AC38R	5.3	7	0.5	1/2	0.0	-0.2	5/8	-0.3	-2.7			
AC39	5.3	2	0.2	1/2	0.0	-0.2	5/8	-0.1	-2.8			
AC40	5.0	2	0.2	1/2	0.0	-0.2	5/8	-0.1	-2.7			
AC41	17.9	2	0.2	1/2	0.0	-0.2	7/8	-0.1	-2.4			
AC42R	17.9	2	0.2	1/2	0.0	-0.2	7/8	-0.1	-2.5			
AC43	7.7	7	0.6	1/2	0.0	-0.3	1 1/8	0.0	-2.5			
AC44R	7.7	2	0.2	1/2	0.0	-0.3	7/8	0.0	-2.5			
Discharge / Heat Reclaim (Sheet R1.5)												
AD	146.1	76	5.2				1 5/8					
ESTIMATED TOTAL PIPE THIS SYSTEM (ft)												
3/8"	1/2"	5/8"	7/8"	1 1/8"	1 3/8"	1 5/8"	2 1/8"	2 5/8"	3 1/8"			
29	646	476	273	313	86	316	61	0	0			
ESTIMATED REFRIGERANT CHARGE THIS SYSTEM (lb's)												
Condenser	Receiver	Piping	Evaporators									
32	80	157	69									339

SYSTEM B										
Loop/ Segment	Load (mbh)	Line Length (ft)	Refrig. (lb's)	LIQUID			VAPOR			
				Pipe Size	Temperature Drop (F)	Branch	Pipe Size	Temperature Drop (F)	Branch	
Main Liquid (Sheet R1.3)				# Designates valve location						
BL1	294.3	3	1.1	1 1/8	0.0	0.0				
BL1R	294.3	6	2.3	1 1/8	0.0	0.0				
BL3	294.3	31	11.7	1 1/8	-0.2	-0.2				
BL4	78.9	8	0.9	5/8	-0.1	-0.3				
BL5R	18.0	10	0.7	1/2	0.0	-0.3				
BL6	60.9	36	3.8	5/8	-0.3	-0.6				
BL7R	60.9	13	1.4	5/8	-0.1	-0.7				
BL8	215.3	32	12.0	1 1/8	-0.1	-0.5				
BL9	162.0	16	3.5	7/8	-0.2	-0.5				
BL10R	38.5	13	0.9	1/2	-0.2	-0.7				
BL11	123.5	14	3.1	7/8	-0.1	-0.6				
#BL12R	28.9	20	1.3	1/2	-0.2	-0.8				
BL13	94.6	14	1.5	5/8	-0.3	-0.9				
BL14R	40.5	13	0.9	1/2	-0.2	-1.1				
BL15R	54.0	13	0.9	1/2	-0.3	-1.2				
BL16	53.4	22	2.3	5/8	-0.2	-0.5				
BL17	40.1	7	0.5	1/2	-0.1	-0.6				
BL18R	-0.1	10	0.7	1/2	-0.1	-0.7				
BL19	13.3	50	3.3	1/2	-0.3	-0.6				
BL20R	13.3	10	0.7	1/2	0.0	-0.6				
Main Suction (Sheet R1.3)				# Designates valve location						
BS1R	294.3	8	0.5				3 1/8	0.0	0.0	
BS2	294.3	15	0.9				3 1/8	-0.1	-0.1	
BS3	78.9	8	0.1				1 5/8	-0.1	-0.2	
BS4R	18.0	10	0.0				7/8	-0.2	-0.4	
BS5	60.9	36	0.4				1 3/8	-0.6	-0.6	
BS6R	60.9	13	0.1				1 3/8	-0.2	-1.0	
BS7	215.3	32	1.9				3 1/8	-0.1	-0.2	
BS8	162.0	16	2.4				3 1/8	-0.2	-0.4	
BS9R	38.5	13	0.1				1 1/8	-0.3	-0.7	
BS10	123.5	14	0.4				2 1/8	-0.1	-0.5	
#BS11R	28.9	20	0.1				1 1/8	-0.2	-0.7	
BS12	94.6	14	0.2				1 5/8	-0.2	-0.7	
BS13R	40.5	13	0.1				1 1/8	-0.3	-1.0	
BS14R	54.0	13	0.1				7/8	-0.5	-0.8	
BS15	53.4	22	0.3				1 5/8	-0.1	-0.5	
BS16	40.1	7	0.1				1 1/8	-0.2	-0.5	
BS17R	-0.1	10	0.1				1 1/8	-0.2	-0.7	
BS18	13.3	50	3.0				7/8	-0.2	-1.0	
BS19R	13.3	10	0.0				5/8	-0.6	-1.4	
Underfloor (Sheet R1.2)										
NONE										
Case/Cooler Top & Case To Case (Sheet R1.4)				Designates factory top piping by OEM, # Designates valve location						
BC1	18.0	2	0.1	1/2	0.0	-0.3	7/8	0.0	-0.4	
BC2R	18.0	2	0.1	1/2	0.0	-0.3	7/8	0.0	-0.4	
#BC3	60.9	3	0.2	1/2	-0.1	-0.8	1 3/8	0.0	-1.0	
BC4	53.3	6	0.5	1/2	-0.1	-0.9	1 3/8	-0.1	-1.1	
#BC5R	53.3	7	0.5	1/2	-0.2	-1.1	1 3/8	-0.1	-1.2	
BC6	53.3	2	0.2	1/2	0.0	-1.1	1 3/8	0.0	-1.2	
BC7	38.8	12	0.9	1/2	-0.1	-1.2	1 1/8	-0.2	-1.4	
BC8	162.0	12	0.8	1/2	-0.1	-1.3	7/8	-0.3	-1.7	
BC9	10.2	8	0.5	1/2	0.0	-1.3	5/8	-0.3	-2.0	
BC10	7.6	37	2.5	1/2	0.0	-0.8	5/8	-0.8	-1.8	
#BC11R	7.6	7	0.1	1/2	0.0	-0.8	5/8	-0.2	-2.0	
BC12	7.6	2	0.1	1/2	0.0	-0.8	5/8	0.0	-2.0	
#BC13	38.5	5	0.4	1/2	-0.1	-0.8	1 1/8	-0.1	-0.8	
BC14R	38.5	7	0.5	1/2	0.0	-0.9	1 1/8	-0.1	-0.9	
BC15	38.5	2	0.1	1/2	0.0	-0.9	1 1/8	0.0	-0.9	
BC16	11.0	8	0.5	1/2	0.0	-0.9	5/8	-0.4	-1.3	
BC17	16.5	13	0.9	1/2	0.0	-0.9	7/8	-0.2	-1.1	
BC18	28.9	1	0.1	1/2	0.0	-0.8	1 1/8	0.0	-0.7	
BC19	3.4	2	0.1	1/2	0.0	-0.8	1/2	0.0	-0.7	
BC20	25.5	4	0.3	1/2	0.0	-0.8	7/8	-0.1	-0.8	
BC21	20.0	7	0.2	1/2	0.0	-0.8	7/8	-0.2	-1.0	
BC22	5.5	2	0.1	1/2	0.0	-0.8	1/2	-0.1	-1.1	
BC23	8.9	8	0.5	1/2	0.0	-0.8	5/8	-0.2	-1.2	
BC24	2.5	2	0.1	1/2	0.0	-0.8	7/8	0.0	-1.0	
BC25	3.4	3	0.2	1/2	0.0	-0.8	1/2	-0.1	-1.3	
#BC26	40.5	1	0.1	1/2	0.0	-1.1	1 1/8	0.0	-1.2	
#BC27R	40.5	7	0.5	1/2	-0.1	-1.2	1 1/8	-0.1	-1.5	
BC28	40.5	2	0.1	1/2	0.0	-1.2	1 1/8	0.0	-1.2	
BC29	20.3	12	0.8	1/2	-0.1	-1.3	7/8	-0.3	-1.5	
#BC30	54.0	11	0.2	1/2	-0.1	-1.5	3/8	-0.5	-1.8	
#BC31R	54.0	7	0.5	1/2	-0.2	-1.7	1 3/8	-0.1	-1.1	
BC32	54.0	2	0.2	1/2	0.0	-1.7	1 3/8	0.0	-1.1	
BC33	33.8	12	0.9	1/2	-0.1	-1.8	1 1/8	-0.2	-1.3	
BC34	3.4	8	0.5	8	0.0	-1.8	5/8	-0.5	-1.8	
#BC35	40.1	2	0.1	1/2	0.0	-0.7	1 1/8	0.0	-0.7	
BC36R	20.0	2	0.1	1/2	0.0	-0.7	5/8	-0.2	-0.9	
BC37	30.0	16	1.2	1/2	-0.1	-0.8	7/8	-0.3	-1.0	
BC38R	20.0	2	0.1	1/2	0.0	-0.8	7/8	0.0	-1.0	
#BC39	13.3	10	0.7	1/2	0.0	-0.6	5/8	-0.6	-2.0	
BC40R	13.3	2	0.1	1/2	0.0	-0.6	5/8	0.0	-2.0	
Discharge / Heat Reclaim (Sheet R1.5)										
BD	299.2	51	3.5				1 5/8			
BHS	299.2	127	8.6				1 5/8			
BHR	299.2	127	8.6				1 5/8			
ESTIMATED TOTAL PIPE THIS SYSTEM (lb)										
3/8"	1/2"	5/8"	7/8"	1 1/8"	1 3/8"	1 5/8"	2 1/8"	2 5/8"	3 1/8"	
0	360	168	160	172	96	349	90	0	55	
ESTIMATED REFRIGERANT CHARGE THIS SYSTEM (lb)										
Condenser		Receiver		Piping		Evaporators				Total
43		80		59		96				318