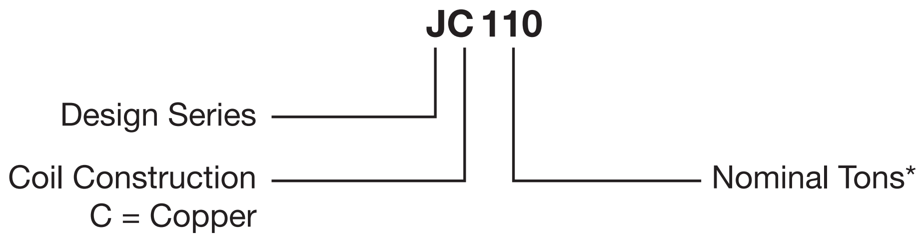
JC series
EVAPORATIVE CONDENSER

engineering data

RECOLD®

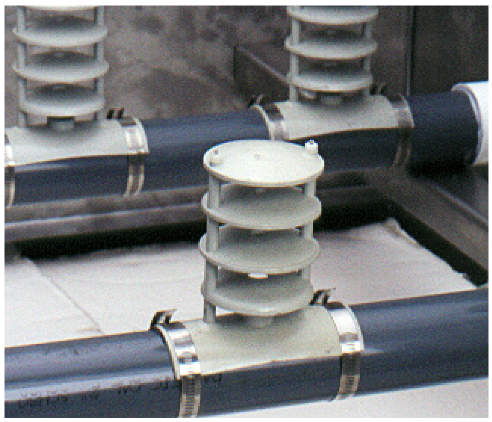
Nomenclature



*At 105°F condensing temperature, 78° wet bulb temperature, 40°F suction temperature, refrigerants R12, R22, R502.

RECOLD HYDROSPRAY

Recold engineering has developed an exclusive water distribution system called hydrospray. This unique system provides optimum water coverage of the heat transfer coil for maximum efficiency and virtual elimination of harmful scale problems that result from uneven water distribution. This process is accomplished through a limited number of large orifice non-clogging diffusers mounted on a heavy duty PVC pipe water header.



The JC Evaporative Condenser is a ruggedly built unit constructed to provide many years of durable, dependable service with minimal maintenance requirements. Quality materials and workmanship are a key factor in meeting this objective.

FAN MOTORS

Fan motors furnished as standard equipment are open drip-proof type suitable for outdoor service. Motors have a 1.15 service factor and are mounted on a heavy duty adjustable base located for easy access.

FAN GUARD SCREENS

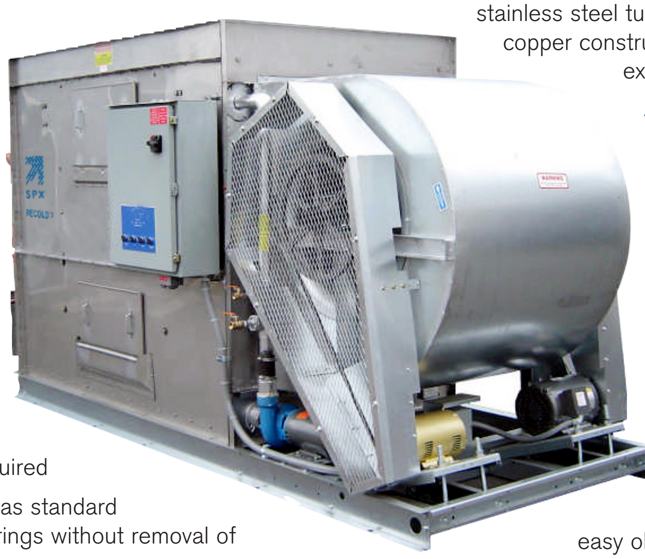
All moving parts are protected with OSHA approved galvanized steel screens. Each guard is easily removed for access to the fan.

FAN SECTION

The centrifugal fan is forward curved, statically and dynamically balanced and constructed of galvanized steel. The fan housing has curved inlet rings for efficient air entry and discharge into the pan. Fans are mounted on a solid steel shaft coated to resist corrosion. Heavy duty, pillow block type, self-aligning ball bearings are located at each end of the fan shaft.

No intermediate bearings are required

Extended lube lines are supplied as standard equipment to allow servicing bearings without removal of fan guard screens.



WATER CIRCULATION PUMP

The water circulation pump is a close coupled, bronze fitted centrifugal type with mechanical seal. Each pump is factory mounted and piped. Standard motor is open drip-proof suitable for outdoor service.

DRIFT ELIMINATORS

Eliminators are constructed of PVC assemblies in removable, easy to handle sections. Each section has a three break design allowing three changes in air flow and measure approximately 5 inches in depth. The use of durable PVC eliminates the corrosion problems associated with galvanized eliminators.

HEAT EXCHANGE COIL

Coil tube bundle is constructed of ⅝" copper tubing with stainless steel tube sheets and copper headers. The copper construction offers a noncorrosive coil for extended service life.

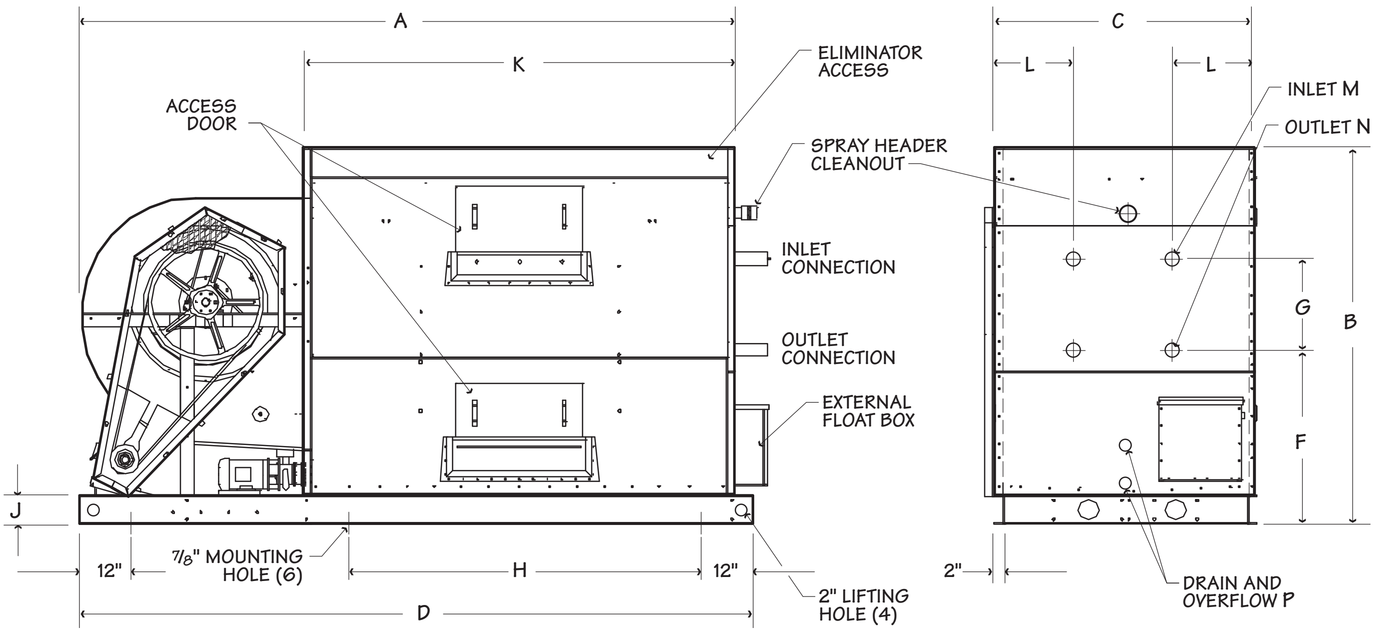
ACCESS DOORS

Large rectangular access doors are strategically located to provide access to both upper water distribution system and lower pan basin. The patented doors provide a complete air and water tight seal without the use of gaskets or fasteners

WATER MAKE-UP

Water make-up is provided by a solid brass float valve with arm and float ball installed in an external float box. This allows easy observation of the water operating level and maintenance of the valve with unit in operation.

CONSTRUCTION: The Evaporative Condenser sump pan is constructed of 300 series stainless steel and casing panels are constructed of heavy gauge, G-235 galvanized steel. The sump pan and casing panels are flanged outward so that all the connecting fasteners are located outside the flooded section of the unit to help prevent leaks in the unit and provides a more permanent watertight joint. To provide further protection from corrosion, no welded joints are located below the water line. The unit is designed for a 30 psf on any projected area and ships in one piece on a minimum 6" high stainless steel channel base to help in handling and installation of the unit.



MODEL	DIMENSIONS												ACCESS DOORS				OVERFLOW DRAIN FPT	WATER SUPPLY FPT
													FAR SIDE		NEAR SIDE			
	A	B	C	D	F	G	H	J	K	L	M	N	TOP	BOTTOM	TOP	BOTTOM	P	Q
JC20 thru JC30	80"	76"	32"	84"	32¼"	20½"	–	6"	53"	13½"	2⅛"	1⅝"	1	1	–	–	2½"	½"
JC38 thru JC58	96"	76"	38"	102"	31½"	20½"	–	6"	65"	16	2⅛"	1⅝"	1	1	–	–	2½"	½"
JC63 thru JC80	115¾"	77"	46¼"	124"	33¼"	20½"	51¼"	6	76¾"	20½"	2⅝"	2⅛"	1	1	1	1 note 3	2½"	½"
JC90 thru JC120	139½"	81"	56⅝"	144"	38"	19½"	51"	6"	92"	14½"	3⅛"	2⅝"	1	1	1	1 note 3	2½"	¾"
JC135 thru JC200	172¼"	92½"	67¾"	180¼"	41"	19½"	71¾"	6"	115"	17½"	3⅛"	2⅝"	2	1	2	1 note 3	2½"	1"
JC240 thru JC285	184¼"	98	94½"	192"	47"	19½"	84½"	8"	115"	note 4	2@3⅛"	2@2⅝"	2	1	2	1 note 3	3"	1¼"
JC320 JC350	208"	98½"	94½"	217"	47"	19½"	96½"	8"	139¼"	note 4	2@3⅛"	2@3⅛"	2	1	2	1 note 3	3"	1¼"
JC375 JC400	221"	118½"	101½"	225"	67"	19½"	80"	10"	139½"	note 4	2@3⅛"	2@3⅛"	2	2	2	2 note 3	4"	1¼"
JC425 JC450	245½"	118½"	101½"	248"	67"	19½"	104"	10"	164½"	note 4	2@3⅛"	2@3⅛"	2	2	2	2 note 3	4"	1¼"
JC475 JC525	269"	118½"	101½"	273"	67"	19½"	128"	10"	188"	note 4	2@3⅛"	2@3⅛"	2	2	2	2 note 3	4"	1¼"

Note

1 Use this bulletin for preliminary layouts only. Obtain current drawing from your Recold sales representative.

2 If required add 6½" for positive closure dampers.

3 An additional bottom access door is installed on the connection end.

4. Consult Recold for size and location of connections on multi-circuited coils.

5 If supporting the unit on beams, refer to the Recold suggested supporting steel drawing for required mounting hole location.

MODEL	FAN MOTOR hp*	STANDARD FAN MOTOR FRAME	SUMP HEATER kW	SUMP CAPACITY gal	AIR VOLUME cfm	FAN RPM	FAN SIZE in	COIL FACE sq ft
JC20	2	145T	1.5	32	3200	960	18	704
JC25	2	145T	1.5	43	5280	589	18	9.7
JC30	3	182T	1.5	43	5900	796	18	9.7
JC38	3	182T	2.6	64	7400	601	21	14.5
JC46	3	182T	2.6	64	7000	636	21	14.5
JC52	5	184T	2.6	64	8500	729	21	14.5
JC58	5	184T	2.6	64	8300	740	21	14.5
JC63	3	182T	2.6	95	9800	452	25	21.6
JC72	5	184T	2.6	95	11800	523	25	21.6
JC80	7½	213T	2.6	95	13000	614	25	21.6
JC90	7½	213T	4.0	163	19000	413	31	32.5
JC110	10	215T	4.0	163	20000	462	31	32.5
JC120	10	215T	4.0	163	19500	476	31	32.5
JC135	10	215T	5.5	248	26500	344	37	49.6
JC165	10	215T	5.5	248	26000	356	37	49.6
JC180	10	215T	5.5	248	24100	350	37	49.6
JC200	15	254T	5.5	248	28400	385	37	49.6
JC240	20	256T	8.0	374	37200	385	40	70.4
JC270	20	256T	8.0	374	36600	385	40	70.4
JC285	25	284T	8.0	374	39000	415	40	70.4
JC320	30	286T	11.0	454	52300	415	40	85.5
JC350	30	286T	11.0	454	50000	430	40	85.5
JC375	30	286T	11.0	748	58300	252	49	92.5
JC400	30	286T	11.0	748	61000	267	49	92.5
JC425	41	324T	14.0	880	66000	256	49	108.9
JC450	41	324T	14.0	880	69000	271	49	108.9
JC475	50	326T	16.0	1012	76500	262	49	125.2
JC525	50	326T	16.0	1012	80000	278	49	125.2

* For static pressure from ¼ to ½ ESP use next size larger motor

MODEL	PUMP MOTOR hp	SPRAY WATER GPM	REFRIGERANT CHARGE lb		APPROXIMATE WEIGHT lb	
			R-22	R-404	SHIPPING	OPERATING
JC20	½	40	47	49	810	1230
JC25	½	40	40	41	910	1450
JC30	½	40	52	54	960	1500
JC38	½	50	61	64	1280	1940
JC46	½	50	81	84	1350	2010
JC52	½	50	91	95	1360	2020
JC58	½	50	99	103	1435	2395
JC63	¾	70	121	126	1940	2900
JC72	¾	70	138	144	1955	2915
JC80	¾	70	150	156	2074	3483
JC90	1	110	142	149	2965	4190
JC110	1	110	188	196	3090	4560
JC120	1	110	230	240	3305	4919
JC135	2	150	236	246	4355	6335
JC165	2	150	312	326	4610	6680
JC180	2	150	354	369	4860	7020
JC200	2	150	393	410	4880	7040
JC240	3	270	437	456	6675	10200
JC270	3	270	498	516	7045	10900
JC285	3	270	522	544	7075	11200
JC320	3	325	455	478	7725	11900
JC350	3	325	484	580	8180	12900
JC375	5	365	599	604	9160	15700
JC400	5	365	748	753	9660	16300
JC425	5	400	705	710	10070	17700
JC450	5	400	881	888	10660	18500
JC475	5	450	817	824	11005	19800
JC525	5	450	1015	1022	11700	20700

The JC Series unit model selection may be obtained by using one of two methods presented. The simplest method is based on evaporator ton load and is ***i**ntended for open type reciprocating compressor applications.*

The second method is selected by total heat of rejection which provides a more comprehensive and accurate procedure. In addition to selecting units for open type reciprocating compressor systems, this method may be applied to selecting condensers for systems with centrifugal, hermetic reciprocating or rotary screw type compressors.

EVAPORATOR TON METHOD

The JC condenser model numbers in Table 1 are equal to the unit capacity in evaporator tons at standard conditions for refrigerant 12, 22 and 502 at 105°F condensing temperature, 40°F suction temperature, and 78°F wet bulb temperature.

When selecting a unit for non-standard conditions, enter Table 2, Page 7, to select capacity correction factors and multiply times the system evaporator ton load. Select the standard unit model number which is greater than or equal to this product.

From Table 4 Capacity Factor at 75° F wet bulb and 105°F Cond. = .93.

EXAMPLE

Given:	Evaporator Loan, R-22	81 Tons
	Entering Air Wet Bulb	72°F
	Condensing Temperature	105°F
	Suction Temperature	30°F

Determine Condenser Selection:

From Table 2 Capacity Factor at 72°F wet bulb and 105°F Cond. = .86.

Suction Pressure Capacity Factor at 30°F = 1.03.

81 Tons x .86 x 1.03 = 71.7 corrected tons

Select Model JC72 since its model number is greater than the design corrected evaporator load.

TABLE NO. 1: Standard Conditions

JC MODEL NUMBER AND CAPACITY																											
20	25	30	38	46	52	58	63	72	80	90	110	120	135	165	180	200	240	270	285	320	350	375	400	425	450	475	525

Based on standard conditions for refrigerants R-12, R-22 and R-502 at 105°F cond., 40° suction, 78° WB.

JC Series is not applicable for ammonia systems.

TABLE NO. 2: Evaporator Capacity Factors

NON-STANDARD CONDITIONS – REFRIGERANTS R12, R22, R500 AND R502														
COND. PRESSURE PSIG		**COND. TEMPERATURE** °F	**WET BULB TEMPERATURE** °F											
R12	**R22**		**50**	**55**	**60**	**65**	**68**	**70**	**72**	**75**	**78**	**80**	**85**	**90**
91.8	155.7	85	1.05	1.16	1.33	1.61	1.87	1.98	2.26	2.80				
99.8	168.4	90	.90	.98	1.11	1.28	1.43	1.54	1.72	1.96	2.33	2.70		
108.3	181.8	95	.75	.85	.93	1.04	1.12	1.18	1.28	1.39	1.59	1.75	2.50	
117.2	195.9	100	.70	.75	.81	.88	.93	.97	1.03	1.11	1.22	1.32	1.70	2.53
126.6	210.8	105	.63	.66	.70	.76	.79	.83	.86	.93	1.00	1.05	1.27	1.67
136.4	226.4	110	.57	.60	.63	.67	.70	.72	.75	.80	.85	.89	1.02	1.26
146.8	242.7	115		.54	.57	.60	.63	.64	.66	.69	.73	.75	.84	.99
157.7	259.9	120				.53	.55	.56	.58	.60	.63	.65	.70	.81

Evap Load x Factors = Corrected Tons

SUCTION PRESSURE CAPACITY FACTORS									
SUCTION	**R-12**	0.6	4.5	9.2	14.6	21.0	28.5	37.0	46.7
PRESSURE	**R-22**	10.2	16.5	24.0	32.8	43.0	54.9	68.5	84.0
PSIG	**R-502**	15.5	22.8	31.2	41.1	52.5	65.4	80.2	96.9
SUCTION TEMPERATURE °F		-20	-10	0	+10	+20	+30	+40	+50
CAPACITY FACTOR		1.32	1.23	1.17	1.11	1.07	1.03	1.00	.97

HEAT OF REJECTION METHOD

Many times, the specification for an evaporative condenser will be expressed in "Total Heat Rejection" (THR) at the condenser, rather than the net refrigeration effect at the evaporator. Basically, total heat rejection is the sum of the compressor capacity in BTUH and the heat corresponding to the brake horsepower (BHP) in BTUH for open type compressors or to the kilowatt (kW) input in BTUH for hermetic compressors.

Where the "Total Heat Rejection" is not specified, it can be readily calculated by using the following formulas:

Open Type Compressor:

THR = Compressor Evaporator Capacity (BTUH) + Compressor bhp x 2545

Hermetic Compressor:

THR = Compressor Evaporator Capacity (BTUH) + Compressor kW x 3413

The selection procedure for this method is similar to that given for the evaporator ton method once the heat of rejection requirements are known. Enter Table 4 and select a capacity factor per design condensing temperature and entering air wet bulb. Multiply the factor times the system total heat of rejection. Select the unit model from Table 3 whose heat of rejection is greater than or equal to this product.

EXAMPLE:

Given:

Compressor Evaporator Capacity	51 Tons
Wet Bulb Temperature	75°F
Condensing Temperature	105°F
Type Compressor	Hermetic R-22
Compressor KW Input	49.0 kW

Determine Condenser Selection:

Heat of Rejection

51 Tons x 12,000	=	612,000 BTUH
49.0 kW x 3413	=	167,000 BTU
Total Heat Rejectio	=	779,000 BTUH

From Table 4 Capacity Factor at 72°F wet bulb and 105°F Cond. = .86

779,000 BTUH x .93 = 724,470 BTUH approx. (724.5 MBH).

Select Model JC52 condenser since its nominal total heat rejection is greater than or equal to the required THR.

TABLE 3 – Nominal Total Heat Rejection – MBH

MODEL	HEAT REJECTION MBH*	MODEL	HEAT REJECTION MBH*
JC20	294.0	JC165	2425.5
JC25	367.5	JC180	2646.0
JC30	441.0	JC200	2940.0
JC38	558.6	JC240	3528.0
JC46	676.2	JC270	3969.0
JC52	764.4	JC285	4189.0
JC58	852.6	JC320	4689.3
JC63	926.1	JC350	5203.8
JC72	1058.4	JC375	5513.0
JC80	1176.0	JC400	5880.0
JC90	1323.0	JC425	6336.0
JC110	1617.0	JC450	6762.0
JC120	1764.0	JC475	7159.0
JC135	1984.5	JC525	7644.0

*Based on standard conditions for refrigerants R-12, R-22 and R-502 at 105°F cond., 40° suction, 78° WB.

TABLE NO. 4: Heat Rejection Capacity Factors

NON-STANDARD CONDITIONS – REFRIGERANTS 12, 22, 500 AND 502														
COND. PRESSURE PSIG		**TEMPERATURE** °F	**WET BULB TEMPERATURE** °F											
R12	**R22**		**50**	**55**	**60**	**65**	**68**	**70**	**72**	**75**	**78**	**80**	**85**	**90**
76.9	133.5	75	1.46	1.66	1.96	2.51	3.11	3.46	4.26					
84.1	145.0	80	1.26	1.41	1.64	2.03	2.44	2.69	3.19	3.93	4.02			
91.8	155.7	85	1.10	1.22	1.39	1.67	1.94	2.13	2.45	2.94	3.02	3.63		
99.8	168.4	90	.93	1.02	1.14	1.32	1.47	1.59	1.75	2.00	2.38	2.75	3.34	
108.3	181.8	95	.80	.87	.95	1.08	1.16	1.22	1.32	1.45	1.61	1.79	2.56	3.09
117.2	195.9	100	.71	.76	.82	.89	.93	1.00	1.03	1.12	1.23	1.33	1.72	2.50
126.6	210.8	105	.63	.66	.70	.76	.79	.83	.86	.93	1.00	1.05	1.27	1.61
136.4	226.4	110	.56	.59	.62	.66	.70	.71	.75	.79	.84	.88	1.01	1.19
146.8	242.7	115		.52	.55	.58	.60	.62	.64	.67	.70	.73	.81	.92
157.7	259.9	120				.51	.53	.54	.55	.57	.60	.62	.68	.75

Total Heat of Rejection x Factor = Nominal Total Heat Rejection

BASIC CONSTANTS

500 = Thermal capacity water in BTUH/°F/GPM

= 8.33 (lb/gallon water x 1.0 (specific heat of water at 60°F) x 60 (minutes/hour)

0.075 = weight one cubic foot standard air (lb)

4.5 = pounds of air/hour/cfm

= .075 (weight one cubic foot standard air) x 60 (minutes/hour)

0.242 = specific heat of air (BTU/pound/°F)

1.09 = 4.5 (pounds of air/hour/cfm x 0.242 (specific heat of air, BTU/pound/°F)

Subcooling:

Standard subcooling coil conditions are 78°W.B., 105° entering liquid, 95° leaving liquid or 10° subcooling.

JC Series Evaporative Condensers are designed for applications where a multiple of refrigeration systems are connected to a single unit. The JC Series Evaporative Condensers can be furnished from the factory having the condenser coil divided into individual refrigerant circuits, each sized to meet a specified capacity. Each circuit is supplied with a hot gas inlet connection and liquid outlet connection, each tagged for identification.

The procedure for selecting a multi-circuited condenser coil is described in the "Selection Example", as outlined below. For circuit identification purposes it is required that circuits be arranged in numerical sequence. The connections for the individual circuits, will be ***numbered at the factory, from left to right when facing connection end of unit,*** with the number 1 circuit being on the extreme left.

Selection Example:

Given:

Condensing Temperature 100°F.

Entering Air Wet Bulb Temp. 72°F.

Ten individual suction cooled hermetic compressors operating at suction temperatures and compressor capacities, as shown in the tabulation below.

Procedure

1. Tabulate data in Columns 1, 2 and 3, making sure circuits are in correct numerical sequence.
2. From Table 5, "Hermetic Compressors," select Evaporator Temperature Capacity Factor applicable to each Suction Temperature listed in Column 2 and tabulate in Column 4.
3. From Table 7, select "Condenser Capacity Coversion Factor" applicable to the design condensing temperature and the design entering air wet bulb temperature and tabulate in Column 5.
4. Multiply figures in Columns 3, 4 and 5 for each circuit, and tabulate in Column 6.
5. Add all the capacities in Column 6, to arrive at the Total Adj. BTUH to Nominal required and use the total to select the proper size condenser.

Selection

The total Adj. BTUH to Nominal capacity, for the four refrigeration systems, of 994,900 BTUH, Table 6 shows the smallest unit that will meet the requirement is Model JC72 with a THR of 1,058,400 BTUH. To determine the number of tube circuits required for each sequence number circuit divide Column 6 by Column 7, for each circuit and tabulate in Column 8. If the decimal part of the tube circuit requirement is less than .3, drop the decimal and enter the whole number in Column 9. If the decimal part is equal to or greater than .2, round off to the next higher whole number and enter in Column 9.

The "Tabulation Sample" shows 33 tube circuits are required, for this example, and Table 6 shows that Model JC72 has 33 tube circuits available, therefore, is the proper unit selection.

Note:

If the summation of the number of tube circuits assigned to the individual circuits is less than the total number of tube circuits available in the unit, by inspection, add enough tubes to effect a balance. If the summation of the number of tube circuits assigned to the individual circuits is greater than the total number of tube circuits available in the unit by inspection, delete enough tubes to effect a balance. However, if such reduction causes more than a 10,% reduction in any of the circuits, go to the next larger unit size and reassign tube circuits to give adequate capacity to every circuit.

Tabulation Example

1	2	3	x	4	x	5	=	6	/	7	=	8	9
CIRCUIT NUMBER	**SUCTION TEMP** °F	**COMP. CAPACITY** BTUH	**x**	**EVAP. TEMP. CAP. CONVERSION** TABLE 11	**x**	**COND. CAP. CONVERSION FACTOR** TABLE 12	**=**	**ADJ. BTUH TO NOMINAL**	**/**	**CAPACITY PER TUBE CIRCUIT** TABLE 10	**=**	**NUMBER OF CIRCUITS REQUIRED**	**NUMBER OF CIRCUITS USED**
1	-20	108,600	x	1.79	x	1.03	=	200,200	/	32,070	=	6.24	7
2	+10	90,700	x	1.51	x	1.03	=	141,100	/	32,070	=	4.40	5
3	+20	185,400	x	1.45	x	1.03	=	276,900	/	32,070	=	8.63	9
4	+40	275,000	x	1.33	x	1.03	=	376,700	/	32,070	=	11.75	12
								994,900					**33**

TABLE 5 – Evaporative Temperature Capacity Conversion Factor

EVAPORATIVE TEMP °F	**-40**	**-30**	**-25**	**-20**	**-15**	**-10**	**-5**	**0**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**
Open Compressors	1.75	1.65	1.62	1.59	1.55	1.53	1.50	1.47	1.44	1.40	1.37	1.35	1.32	1.30	1.28	1.26	1.24	1.22
Hermetic Compressors	2.02	1.90	1.852	1.79	1.74	1.69	1.65	1.61	1.57	1.51	1.48	1.45	1.40	1.36	1.34	1.33	1.32	1.31

TABLE 6 – Total Heat Rejection Capacity

MODEL NUMBER	NUMBER OF TUBE CIRCUITS AVAILABLE	AT 105°F COND. TEMPERATURE 78°F WB TEMPERATURE REFRIGERANTS R12, R22 AND R502	
		TOTAL UNIT BTUH	BTUH PER TUBE CIRCUIT
JC20	19	294,000	15,470
JC25	21	367,500	17,500
JC30	21	441,000	21,000
JC38	26	558,600	21,485
JC46	26	676,200	26,000
JC52	26	764,400	29,400
JC58	26	852,600	32,790
JC63	33	926,100	28,060
JC72	33	1,058,400	32,070
JC80	33	1,176,000	35,636
JC90	82	1,323,000	16,130
JC110	82	1,617,000	19,220
JC120	82	1,764,000	21,510
JC135	100	1,984,500	19,845
JC165	100	2,425,500	24,255
JC180	100	2,646,000	26,460
JC200	100	2,940,000	29,400
JC240	140	3,528,000	25,200
JC270	140	3,969,000	28,350
JC285	140	4,189,500	29,925
JC320	140	4,689,300	33,495
JC350	140	5,203,800	37,170
JC375	152	5,513,000	36,270
JC400	152	5,880,000	38,680
JC425	152	6,336,000	41,680
JC450	152	6,762,000	44,490
JC475	152	7,159,000	47,100
JC525	152	7,644,000	50,290

Note: Models JC240 through JC525 coil arrangements provide two equal circuits as standard.

TABLE 7 – Condenser Capacity Conversion Factors

REFRIGERANTS 12, 22, 500 AND 502														
COND. PRESSURE PSIG		COND. TEMPERATURE °F	WET BULB TEMPERATURE °F											
R12	R22		50	55	60	65	68	70	72	75	78	80	85	90
76.9	133.5	75	1.46	1.66	1.96	2.51	3.11	3.46	4.26					
84.1	145.0	80	1.26	1.41	1.64	2.03	2.44	2.69	3.19	3.93	4.02			
91.8	155.7	85	1.10	1.22	1.39	1.67	1.94	2.13	2.45	2.94	3.02	3.63		
99.8	168.4	90	.93	1.02	1.14	1.32	1.47	1.59	1.75	2.00	2.38	2.78	3.34	
108.3	181.8	95	.80	.87	.95	1.08	1.16	1.22	1.32	1.45	1.61	1.79	2.56	3.09
117.2	195.9	100	.71	.76	.82	.89	.93	1.00	1.03	1.12	1.23	1.33	1.72	2.50
126.6	210.8	105	.63	.66	.70	.76	.79	.83	.86	.93	1.00	1.05	1.27	1.61
136.4	226.4	110	.56	.59	.62	.66	.70	.71	.75	.79	.84	.88	1.01	1.19
146.8	242.7	115	.49	.52	.55	.58	.60	.62	.64	.67	.70	.73	.81	.92
157.7	259.9	120	.41	.45	.48	.51	.53	.54	.55	.57	.60	.62	.68	.75

CAPACITY CONTROLS

Dual Fan Motors—The dual fan motor package is available as a proven energy saving capacity control option. It consists of furnishing a high efficiency motor, a 1200 RPM, low speed motor, two sets of drives and belts, extended fan shaft and motor bases on opposite sides of the blower. A UL control-starter panel is available as a completely wired package for one point connection.

Variable Speed Drive—A Variable Speed Drive automatically minimize the tower's noise level during periods of reduced load and/or reduced ambient temperature without sacrificing the system's ability to maintain a constant cold water temperature. This is a relatively inexpensive solution, and can pay for itself quickly in reduced energy costs.

Electric Damper Controls—An electric damper control package is available as an accessory for modulating the internal damper system. A proportional solid state actuator is factory mounted below the fan scroll and attached to the damper shaft by connecting linkage. A sensing bulb connected to the actuator by a capillary tube is normally mounted in the unit pan water basin for monitoring the system. However, when specified, a pressure control may be supplied for field mounting to allow direct head pressure control. An end switch located inside the motor actuator may be adjusted to cycle the fan motor on for pressure rise and off when dampers close.

ELECTRONIC WATER LEVEL CONTROL

The electronic water level control package provides a constant and accurate means of monitoring water level in the unit. For this reason, it is often recommended for those installations which require year round operation in low ambient conditions.

The complete package includes an electric float switch with stilling chamber which is factory installed in the pan section of the unit. An electric solenoid valve for water make-up is shipped loose for remote installation. All wiring must be provided in the field by others.

PAN HEATER

The use of a remote sump tank located indoors is a common form of pan water freeze protection for evaporative cooling equipment. However, for those installations which will not allow this type of system, freeze protection may be provided by electric immersion heaters or steam or hot water coils installed in the pan.

The electric heater package consists of immersion heaters installed in the pan to provide efficient even heat distribution. Standard heaters are selected to provide approximately 40°F pan water at -10°F ambient temperature. A low water cutout switch is supplied to prevent heater operation when the elements are not completely submerged. The heaters are monitored by a sump thermostat with remote sensing bulb located in the pan water. All heaters and controls are factory installed for field wiring by others.

NOTE: Pan heater packages are designed to prevent pan water freezing during unit shutdown with fans and pump idle.

SUB-COOLING COILS

The sub-cooling coil accessory consists of an additional coil section located below the standard condensing coil. All coils are leak tested to 350 PSIG under water.

The sub-cooling coil is intended for halocarbon refrigerant applications which specify sub-cooling or system design. In some cases sub-cooling is needed to prevent excessive refrigerant flash off due to a vertical rise in liquid lines or high pressure drop.

The standard design for a sub-cooling section provides approximately 10°F of sub-cooling at standard conditions for halocarbon refrigerants.

VIBRATION ISOLATORS

Spring type vibration isolator rails may be supplied for field installation: some units will require base frame structural support.

STAINLESS STEEL CONSTRUCTION

300 stainless steel construction is offered as an option for sump pan and upper casing panels.

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RECOLD-JC-TECH-11 | ISSUED 9/2017

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