

*Computer Room  
Air Cooled  
Condenser*



**Catalog 401.1  
April 1990  
5 thru 72  
Nominal tons  
Vertical and  
Horizontal**



# General

Russell's Multicon condensers are designed to provide the optimum in heat transfer efficiency and are constructed for years of reliable performance. Available in 23 sizes, the Multicon condensers range in capacity from 5 to 72 nominal tons. Only the highest grades of commercially available aluminum, copper and galvanized steel go into the manufacturing of each Multicon air cooled condenser. After assembly every unit is closely inspected before it is securely crated to ensure trouble free installation and operation.

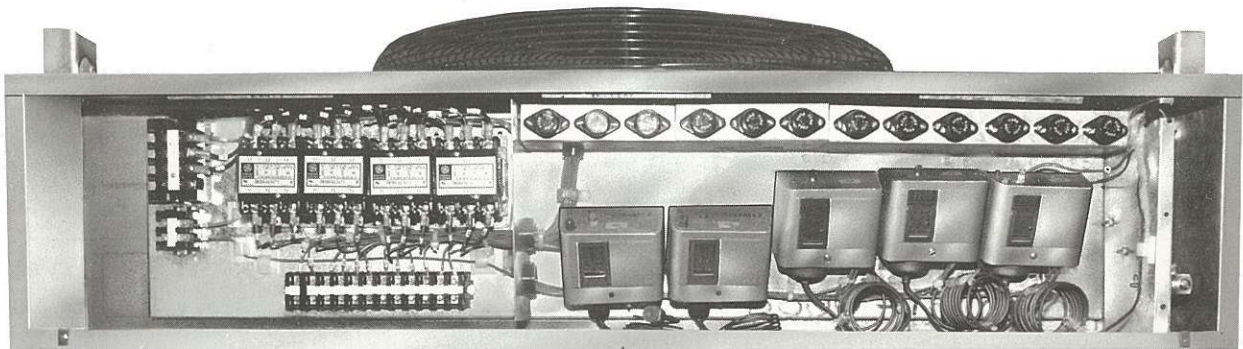
# Features

## FAN / MOTOR

- All fans are sized for maximum energy efficiency, minimum noise, and are individually balanced to minimize vibration.
- All models have die stamped aluminum blades riveted to a galvanized steel spider assembly.
- Fan guards are fabricated from heavy gauge steel rod and epoxy coated
- On multiple fan units, all fans are baffled to prevent short-circuiting of air during fan cycling.
- All CAC motor assemblies are supported in all-welded, heavy gauge wire support structures. The wire structures are zinc-chromate coated for corrosion protection.
- All motors have built in thermal protection.
- Motors are available in the following voltages:
  - CAC 5 thru 40 - 1/2 HP 208/230/1/60, psc. Optional 460/1/60, 230/3/60 or 460/3/60.
  - CAC 45 thru 72 - 1-1/2 HP 208/230/460/3/60, open drip-proof.

## COILS

- Coil fins are manufactured from die formed corrugated aluminum. The tubes are seamless 1/2" OD copper, arranged in a staggered pattern and mechanically expanded into the fins and tube sheets for optimum heat transfer efficiency.
- Headers are produced from heavy wall copper tubing, and are brazed to the coil using a high temperature brazing process.
- All coils are leak tested in an illuminated test tank at a pressure of 380 psig.



## OPTIONS

- **Variable speed fan control** — can be supplied on all models up to CAC-60
- **Fan cycling control** — available with contactors and either ambient or head pressure sensors.
- **Flooded condenser control** — available using three-way modulating valves controlled by discharge pressure. Valves are shipped mounted.
- **Motor fusing** — available on all models. Motors can be fused individually or in pairs on double width units (not U.L. listed).
- **Sub-cooling section** — available as an integral part of the condenser
- **Fins** — available in four options; aluminum, copper, polyester coated aluminum, and baked phenolic coated aluminum.
- **Multiple system circuiting** — up to 4 separate systems are available per unit.
- **Hinged venturi panel(s)** — can be provided on all VAC models to allow for easy coil cleaning of the coil fins and quick access to the fan/motor assembly.
- **Horizontal air discharge** — available upon request for all CAC models. Contact Russell for details.

## Physical Data

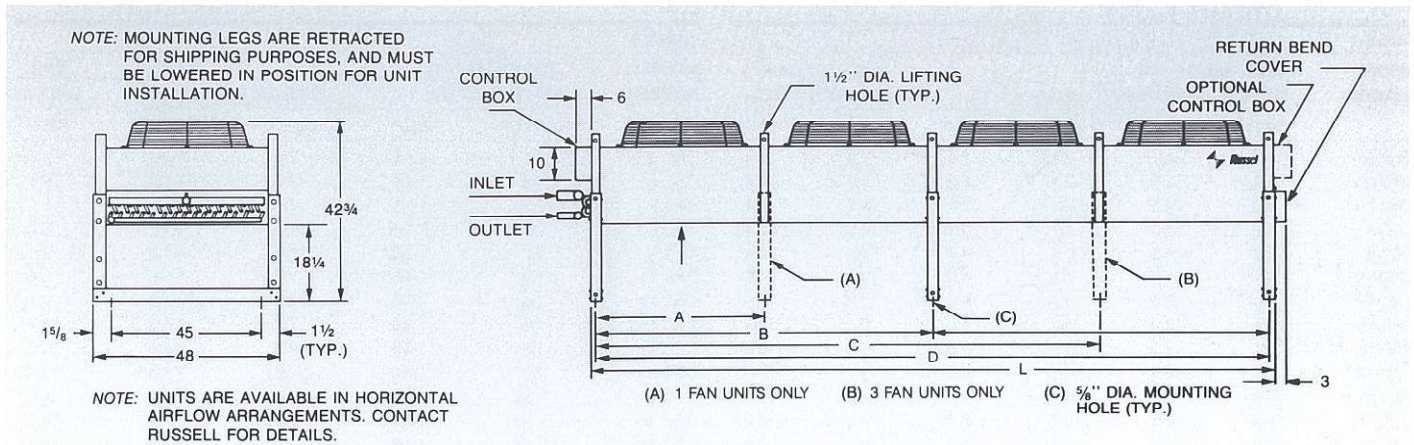


FIGURE 1

TABLE 1

MODEL NUMBER	CONDENSER CAPACITIES (MBH) R-22 REFRIGERANT					
	1 TD	10 TD	15 TD	20 TD	25 TD	30 TD
CAC 5	2.71	27.1	40.7	54.2	67.8	81.3
CAC 6	2.97	29.7	44.6	59.4	74.3	89.1
CAC 7	3.71	37.1	55.7	74.2	92.8	111.3
CAC 8	4.42	44.2	66.3	88.4	110.5	132.6
CAC 9	4.76	47.6	71.4	95.2	119.0	142.8
CAC 11	5.70	57.0	85.5	114.0	142.5	171.0
CAC 13	7.50	75.0	112.5	150.0	187.5	225.0
CAC 15	7.90	79.0	118.5	158.0	197.5	237.0
CAC 17	9.30	93.0	139.5	186.0	232.5	279.0
CAC 19	9.80	98.0	147.0	196.0	245.0	294.0
CAC 21	11.20	112.0	168.0	224.0	280.0	336.0
CAC 24	12.80	128.0	192.0	256.0	320.0	384.0
CAC 28	14.30	143.0	214.5	286.0	357.5	429.0
CAC 30	15.50	155.0	232.5	310.0	387.5	465.0
CAC 37	18.30	183.0	274.5	366.0	457.5	549.0
CAC 40	20.00	200.0	300.0	400.0	500.0	600.0
CAC 45	22.00	220.0	330.0	440.0	550.0	660.0
CAC 50	23.70	237.0	355.5	474.0	592.5	711.0
CAC 56	26.50	265.0	397.5	530.0	662.5	795.0
CAC 60	28.90	289.0	433.5	578.0	722.5	867.0
CAC 62	30.50	305.0	457.5	610.0	762.5	915.0
CAC 67	33.80	338.0	507.0	676.0	845.0	1014.0
CAC 72	35.70	357.0	535.5	714.0	892.5	1071.0

TABLE 2

MODEL NUMBER	DIMENSIONS (IN.)					FAN AND MOTOR DATA						APPROX. NET WT. (LBS)
	A	B	C	D	L	CFM	QTY	DIAM.	MOTOR QTY	DIAM.	MOTOR HP	
CAC 5	30				32-1/4	5200	1	24	1/2			220
CAC 6	30				32-1/4	5100	1	24	1/2			234
CAC 7	30				32-1/4	5000	1	24	1/2			270
CAC 8	30				32-1/4	4900	1	24	1/2			295
CAC 9	30				32-1/4	4800	1	24	1/2			305
CAC 11	30	60			62-1/4	10400	2	24	1/2			340
CAC 13	30	60			62-1/4	10200	2	24	1/2			355
CAC 15	30	60			62-1/4	10000	2	24	1/2			370
CAC 17	30	60			62-1/4	9800	2	24	1/2			400
CAC 19	30	60			62-1/4	9600	2	24	1/2			420
CAC 21	30	60	90		92-1/2	15000	3	24	1/2			510
CAC 24	30	60	90		92-1/2	14750	3	24	1/2			560
CAC 28	30	60	90		92-1/2	14550	3	24	1/2			630
CAC 30	30	60	90	120	122-1/4	20000	4	24	1/2			680
CAC 37	30	60	90	120	122-1/4	19500	4	24	1/2			740
CAC 40	30	60	90	120	122-1/4	19000	4	24	1/2			800
CAC 45	78	126			128-1/4	24850	1	24	1/2	2	30	820
CAC 50	78	126	174		176-1/4	37000	1	24	1/2	3	30	985
CAC 56	78	126	174		176-1/4	36400	1	24	1/2	3	30	1020
CAC 60	78	126	174		176-1/4	35850	1	24	1/2	3	30	1060
CAC 62	96		192		194-1/4	41000		4	30	1-1/2		1100
CAC 67	96		192		194-1/4	40500		4	30	1-1/2		1150
CAC 72	96		192		194-1/4	40000		4	30	1-1/2		1200

TABLE 3 — ALTITUDE CORRECTION FACTOR (FT)

Altitude Factor	Sea Level	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000
	1.0	1.029	1.052	1.076	1.101	1.125	1.151	1.177	1.204	1.231	1.260

## Selections

### Selection Example Given:

Altitude . . . . . 5000 ft.  
 Ambient Temperature . . . . . 90°F  
 Maximum Condensing Temperature . . . . . 110°F  
 Refrigerant . . . . . R-22  
 Design TD . . . . . 20°F  
 Compressor Capacity (NRE) . . . . . 168,000 BTUH

### Solution:

THR Corrected = NRE x Altitude Factor x Heat Rej. Factor (1.28)  
 THR Corrected = 241,920 BTUH or 241.9 MBH  
 Using Table 1 and going down the 20° TD column, a model CAC 24 will give 256.0 MBH thus meeting the required corrected THR of 241.9 MBH.

## Electrical Data

**TABLE 4**

MODEL NUMBER	TOTAL MOTOR FLA WITHOUT VARI-SPEED				TOTAL MOTOR FLA WITH VARI-SPEED	
	230/1	230/3	460/1	460/3	230/1	460/1
	CAC 5	4.2	4.0	2.1	2.0	4.9
CAC 6	4.2	4.0	2.1	2.0	4.9	2.4
CAC 7	4.2	4.0	2.1	2.0	4.9	2.4
CAC 8	4.2	4.0	2.1	2.0	4.9	2.4
CAC 9	4.2	4.0	2.1	2.0	4.9	2.4
CAC 11	8.4	8.0	4.2	4.0	9.1	4.5
CAC 13	8.4	8.0	4.2	4.0	9.1	4.5
CAC 15	8.4	8.0	4.2	4.0	9.1	4.5
CAC 17	8.4	8.0	4.2	4.0	9.1	4.5
CAC 19	8.4	8.0	4.2	4.0	9.1	4.5
CAC 21	12.6	12.0	6.3	6.0	13.3	6.6
CAC 24	12.6	12.0	6.3	6.0	13.3	6.6
CAC 28	12.6	12.0	6.3	6.0	13.3	6.6
CAC 30	16.8	16.0	8.4	8.0	17.5	8.7
CAC 37	16.8	16.0	8.4	8.0	17.5	8.7
CAC 40	16.8	16.0	8.4	8.0	17.5	8.7
CAC 45		17.0		8.7	17.7	9.0
CAC 50		23.4		11.7	24.1	12.0
CAC 56		23.4		11.7	24.1	12.0
CAC 60		23.4		11.7	24.1	12.0
CAC 62		25.6			12.8	
CAC 67		25.6			12.8	
CAC 72		25.6			12.8	

## Refrigerant Data

**TABLE 5**

MODEL NUMBER	CONNECTION SIZE (O.D.)				UNIT CHARGE (LBS)
	SINGLE SYSTEM		DUAL SYSTEM		
	OUTLET	INLET	OUTLET	INLET	
CAC 5	7/8	1-1/8	7/8	1-1/8	3.4
CAC 6	7/8	1-1/8	7/8	1-1/8	3.4
CAC 7	7/8	1-1/8	7/8	1-1/8	5.1
CAC 8	7/8	1-1/8	7/8	1-1/8	6.8
CAC 9	7/8	1-3/8	7/8	1-1/8	6.8
CAC 11	7/8	1-1/8	7/8	1-1/8	6.4
CAC 13	7/8	1-3/8	7/8	1-1/8	9.7
CAC 15	7/8	1-3/8	7/8	1-1/8	9.7
CAC 17	7/8	1-3/8	7/8	1-3/8	13.0
CAC 19	7/8	1-3/8	7/8	1-1/8	16.0
CAC 21	1-1/8	1-5/8	7/8	1-1/8	14.2
CAC 24	1-1/8	1-5/8	7/8	1-3/8	18.9
CAC 28	1-1/8	1-5/8	7/8	1-3/8	24.5
CAC 30	1-1/8	2-1/8	7/8	1-3/8	14.3
CAC 37	1-1/8	2-1/8	1-1/8	1-5/8	24.8
CAC 40	1-1/8	2-1/8	1-1/8	1-5/8	30.9
CAC 45	1-1/8	2-1/8	1-1/8	1-5/8	32.4
CAC 50	1-1/8	2-1/8	1-1/8	1-5/8	26.7
CAC 56	1-3/8	2-1/8	1-1/8	1-5/8	35.5
CAC 60	1-3/8	2-1/8	1-1/8	2-1/8	44.2
CAC 62	1-3/8	2-1/8	1-1/8	2-1/8	39.9
CAC 67	1-3/8	2-5/8	1-1/8	2-1/8	49.9
CAC 72	1-3/8	2-5/8	1-1/8	2-1/8	49.9

## Engineering Specifications

### GENERAL

Furnish and install as specified and as shown on plans, Russell type CAC air cooled condensers, arranged for (horizontal) (vertical) airflow. Condensers shall perform in accordance with (following schedule) (schedule on plan).

Each condenser shall consist of casing, condenser coil, direct driven propeller fan(s) driven by independent fan motor(s), fan guard and mounting legs. All fan motors shall be factory wired to a common electrical control box.

Condensers shall be UL listed and each unit shall bear the UL seal.

### CONDENSER COIL

All condenser coils shall be fabricated of 1/2" O.D. seamless copper tubing. The tubes shall be mechanically expanded into full fin collars for permanent fin-tube contact. Fins shall be (aluminum) (copper) with die formed corrugations for optimum heat transfer capability. For additional corrosion protection the aluminum fins shall have a (polyester) (baked phenolic) coating.

Headers shall be seamless heavy wall copper tubing.

Coils shall be leak tested at 380 psig in an illuminated water test tank.

### HOUSING

The casing of all CAC models shall be constructed from heavy gauge galvanized steel, designed to provide maximum casing rigidity as well as high corrosion protection.

### FANS

All fan blades shall be constructed of aluminum, riveted onto a galvanized steel spider.

Fans shall be designed for low tip speed and minimal noise.

All fans shall be statically balanced and factory run prior to shipping to ensure quiet, trouble-free operation.

All multiple fan condensers shall be supplied with full width baffles to prevent air bypass.

### MOTORS

All motors shall be equipped with inherent overload protection rated for group installation.

All 1/2 HP single phase motors shall be open drip-proof, permanent split capacitor type with permanently lubricated ball bearings.

All 1 1/2 HP motors shall be open drip-proof 230/460/3/60 with permanently lubricated ball bearing. Motor shafts shall be keyed to the fan hub.

Motors shall be mounted in a zinc-chromate coated heavy steel rod support frame.

All units without control packages shall be factory wired into a weatherproof junction box with all motor leads tagged.