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## HOW TO ORDER

This catalog is designed to that you can order directly from it. For each item, photograph, dimension drawing, basic specifications, catalog number are all printed in one place for your convenience.

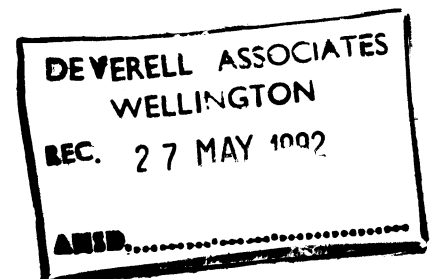
To order simply indicate the catalog number and the quantity desired. Ask us about pricing of large quantities, or about the possibility of special modifications in production quantities. Call: (516) 957-7200. Or write to: Cardwell Condenser Corporation, 80 East Montauk Highway, Lindenhurst, Long Island, New York 11757.

The equipment and components described in this catalog conform to our regular commercial standards. Availability of materials may necessitate deviations from standard finish or design, provided that interchangeability and performance remain unaffected. The Cardwell Condenser Corporation reserves the right to change prices and specifications without notice and without incurring obligation.

All electrical ratings are approximate, since they depend largely upon conditions of use. Where required, information regarding exact ratings, dimensions, and tolerances can be furnished by the factory.

Stated maximum and minimum values of capacitors are nominal, subject to plus or minus tolerances. Guaranteed values or "lowest maximum, highest minimum" should be requested from the factory.

Cardwell products are guaranteed to be free from defects in materials and workmanship for a reasonable time after delivery. However, our liability shall be limited to replacement of defective material.



# AIR VARIABLE CAPACITORS

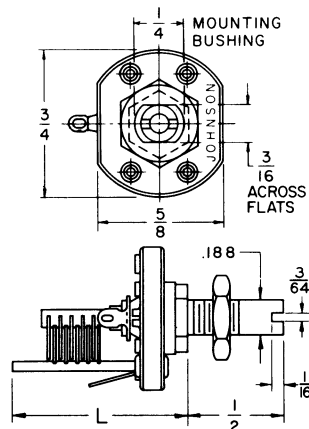
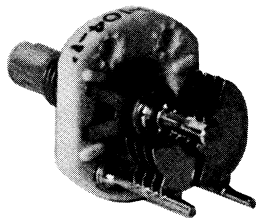
## JOHNSON CAPACITOR DIVISION

### TYPE "M" CAPACITORS

These small Type "M" miniature air variable capacitors are excellent for use in compact equipment. Bridge type stator terminal provides an extremely low inductance path to both stator supports. Soldered plate construction, oversize bearing, and heavily anchored stator supports insure rigidity. Large beryllium copper compression rotor

contact provides steady torque to maintain rotor position. Rotor contact and all other metal parts are nickel-plated—steatite insulator is DC-200 treated. Mounting bushing threaded  $\frac{1}{4}$ "-32, with flats to prevent turning—mounting nut furnished. Peak with-standing voltage 1250 volts on .017" air gap units; 850 volts on 160-0130-

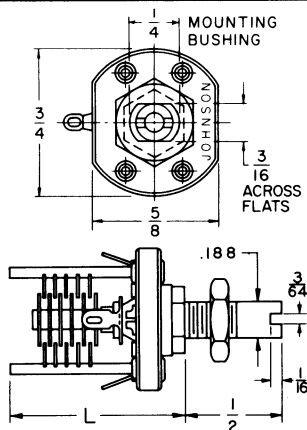
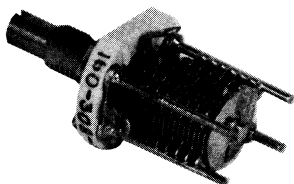
001 which has air gap of .013" between plates.  $\frac{3}{16}$ " diameter shaft slotted for screwdriver adjustment. Available in production quantities with the following features: locking bearing; 180° stop; various shaft extensions; high or low torque; silver or other platings, and MIL-C-92B types.



Cat. No.	Nominal Capacity (pF)		Plates	L ± 1/32"
	Max.	Min.		

#### Type "M" Capacitors—Single Section

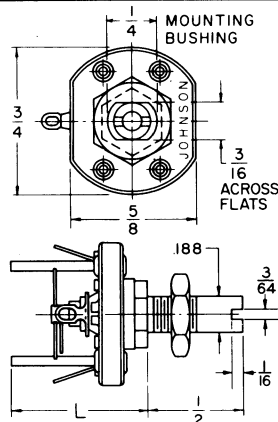
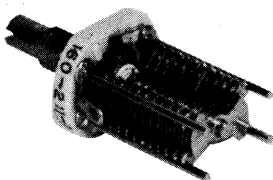
160-102-1	5	1.5	5	$\frac{45}{64}$ "
160-104-1	8.7	1.8	9	$\frac{13}{16}$ "
160-107-1	14.2	2.3	15	1"
160-110-1	19.6	2.7	21	$1\frac{1}{64}$ "
160-130-1	32	3	28	$1\frac{7}{64}$ "



Cat. No.	Nominal Capacity (pF)		Plates Per Sec.	L ± 1/32"
	Max.	Min.		

#### Type "M" Capacitors—Butterfly

160-203-1	3.1	1.5	5	$\frac{45}{64}$ "
160-205-1	5.1	1.8	10	$\frac{13}{16}$ "
160-208-1	8	2.2	16	1"
160-211-1	10.8	2.7	22	$1\frac{1}{64}$ "



Cat. No.	Nominal Capacity (pF)		Plates Per Sec.	L ± 1/32"
	Max.	Min.		

#### Type "M" Capacitors—Differential

160-303-1	5.0	1.5	5	$\frac{45}{64}$ "
160-305-1	8.7	1.8	9	$\frac{13}{16}$ "
160-308-1	14.2	2.3	15	1"
160-311-1	19.6	2.7	21	$1\frac{1}{64}$ "

# AIR VARIABLE CAPACITORS

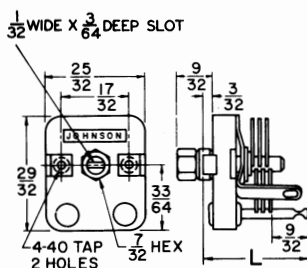
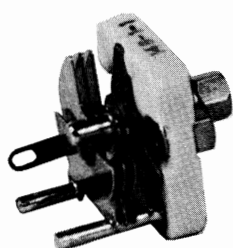
## JOHNSON CAPACITOR DIVISION

## TYPE "S" CAPACITORS

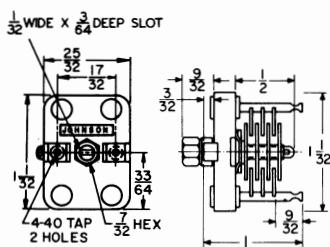
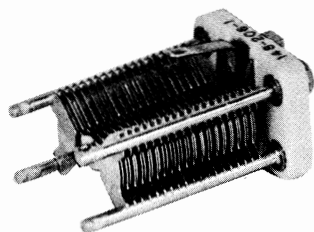
Midway in physical size between the Type "M" and "K" capacitors, the Type "S" is compact in design—rugged in construction. Unit is equipped with DC-200 treated steatite insulator, and nickel-plated brass plates. The "S"

capacitor has a plate air gap of .013" between plates with a peak withstanding voltage of 850 volts. Other spacings; single hole mounting types; straight shafts; screwdriver shaft; or locking-type screwdriver shaft avail-

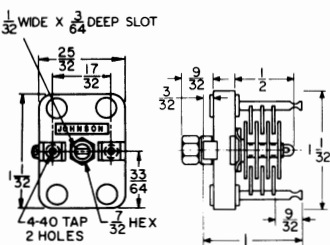
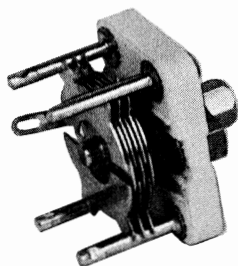
able on special order in production quantities. Available in single section, butterfly, differential and dual section types.



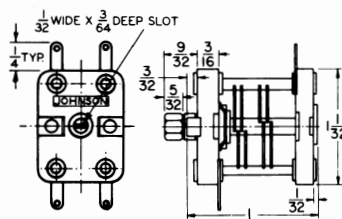
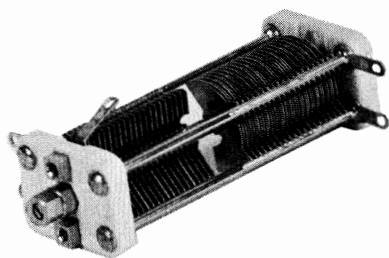
Cat. No.	Nominal Capacity (pF)		Plates	L±1/32"
	Max.	Min.		
Type "S" Capacitors—Single Section				
148-1-1	15	2.3	6	53/64"
148-2-1	25	2.6	10	15/16"
148-3-1	35	2.9	14	1 1/32"
148-4-1	50	3.2	19	1 9/64"
148-5-1	75	3.9	29	1 13/32"
148-6-1	100	4.5	38	1 43/64"



Cat. No.	Nominal Capacity (pF)		Plates	L±1/32"
	Max.	Min.		
Type "S" Capacitors—Butterfly				
148-201-1	9	1.8	6	53/64"
148-202-1	14	2.1	10	15/16"
148-203-1	20	2.4	14	1 1/32"
148-204-1	27	2.8	19	1 9/64"
148-205-1	42	3.6	29	1 13/32"
148-206-1	54	4.4	38	1 43/64"



Cat. No.	Nominal Capacity (pF)		Plates Per Sec.	L ± 1/32"
	Max.	Min.		
Type "S" Capacitors—Differential				
148-301-1	15	2.3	6	53/64"
148-302-1	25	2.6	10	15/16"
148-303-1	35	2.9	14	1 1/32"
148-304-1	50	3.2	19	1 9/64"
148-305-1	75	3.9	29	1 13/32"
148-306-1	100	4.5	38	1 43/64"



Cat. No.	Nominal Capacity (pF)		Plates Per Sec.	L±1/32
	Max.	Min.		
Type "S" Capacitors—Dual Section				
148-503-1	25	2.9	10	1 <sup>25</sup> / <sub>64</sub> "
148-504-1	35	3.2	14	1 <sup>19</sup> / <sub>32</sub> "
148-505-1	50	3.5	19	1 <sup>51</sup> / <sub>64</sub> "
148-507-	100	4.8	38	2 <sup>27</sup> / <sub>32</sub> "

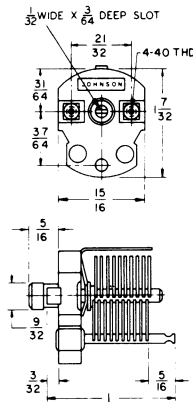
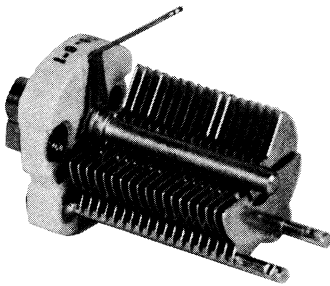
# AIR VARIABLE CAPACITORS

## TYPE "K" CAPACITORS

### JOHNSON CAPACITOR DIVISION

Widely used for military and many commercial applications, the Type "K" capacitor has a DC-200 impregnated steatite insulator, notched stator contacts, and extra-rigid soldered plate construction. Peak withstanding voltage is 1000 volts with a plate air gap

of .015" — plates are nickel-plated brass. Type "K" capacitor available in production quantities to meet MIL-C-92B specifications. Other capacities and variations for specialized military and commercial applications are available in production quantities.



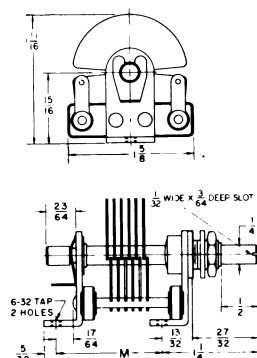
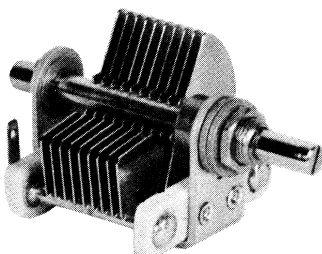
Cat. No.	Nominal Capacity (pF)		Plates	L ± 1/32"
	Max.	Min.		
Type "K" Capacitors				
158-1-1	10	2.3	3	55/64"
158-2-1	26	2.7	7	63/64"
158-3-1	55	3.4	14	1 11/64"
158-4-1	78	4.0	20	1 23/64"
158-5-1	107	4.7	27	1 34/64"
158-6-1	147	5.6	37	1 59/64"

## TYPE "R" CAPACITORS

This rugged Johnson version of a popular standardized capacitor has steatite stator support insulators and soldered .023" thick brass plates. All metal parts are heavily nickel-plated for resistance to corrosion. Sturdy brass end frames

offer excellent rigidity. Double bearing construction and silver-plated beryllium copper wiping contacts provide smooth, reliable performance. Peak withstanding voltage is 1200 volts— with standard .024" air gap. Also avail-

able with .036", .050", .071", or .095" plate air gap, as well as special platings and shaft lengths in production quantities. Available on special order up to 325 pF. Bearing threaded 3/8"-32. Available without mounting feet for panel mounting.



Cat. No.	Nominal Capacity (pF)		Plates	M ± 1/32"
	Max.	Min.		
Type "R" Capacitors				
149-1-1	20	5.3	3	1 7/32"
149-2-1	35	5.6	5	1 7/32"
149-3-1	50	5.9	7	1 7/32"
149-4-1	80	6.6	11	1 7/32"
149-5-1	102	7.1	14	1 13/32"
149-6-1	140	8.0	19	1 19/32"

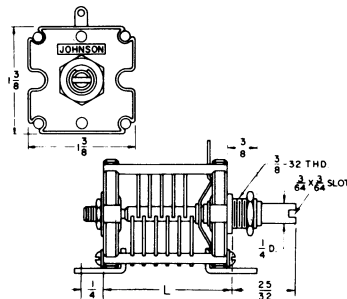
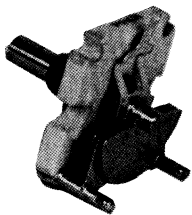
# AIR VARIABLE CAPACITORS

## JOHNSON CAPACITOR DIVISION

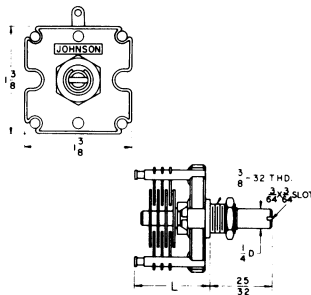
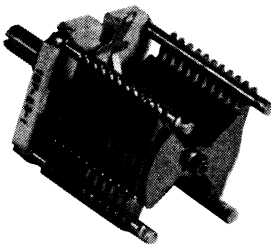
Ideal choice for applications requiring extreme stability and strength. Practically impervious to shock and vibration. Rotor bearings and stator support rods soldered directly to 3/16" thick seatite insulator. Special split-sleeve tension bearing and silver-plated beryllium copper contact provide con-

stant torque and smooth capacity variation. Brass soldered plates and large diameter tie rods provide excellent rigidity. Removable chassis mounting brackets can be used to mount auxiliary equipment. Plating is heavy nickel-plate. Air gap .030". Peak withstanding voltage is 1500 volts. TC is

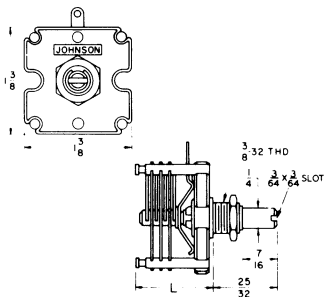
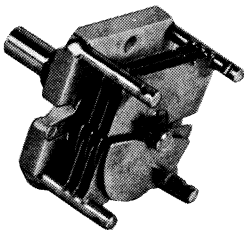
+ 10 ppm/°C or better. Also available with .020", .060" and .080" air gap as well as special platings, shaft lengths, stator terminal locations, and 6-32 tapped mounting posts soldered to end frame, in production quantities. Bearings threaded 3/8"-32, mounting nut provided.



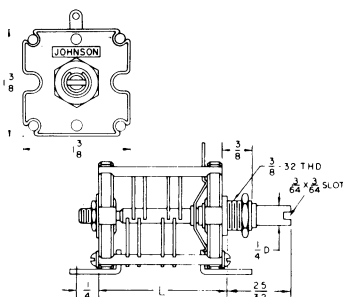
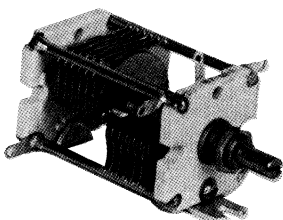
Cat. No.	Nominal Capacity (pF)		Plates	L± 1/32"
	Max.	Min.		
Type "L" Single Section—Single End Plate				
167-1-1	10	2.2	3	3/4"
167-2-1	25	2.9	7	61/64"
167-3-1	50	4.0	13	1 1/4"
167-4-1	75	5.2	19	1 9/16"
Type "L" Single Section—Double End Plate				
167-11-1	99	6.8	25	2 1/32"
167-12-1	202	11.6	51	3 21/64"



Cat. No.	Nominal Capacity (pF)		Plates	L ± 1/32"
	Max.	Min.		
Type "L" Butterfly				
167-21-1	10	2.3	5	55/64"
167-22-1	25	3.7	12	1 1/4"
167-23-1	50	5.9	23	1 3/4"



Cat. No.	Nominal Capacity (pF)		Plates Per Sec.	L ± 1/32"
	Max.	Min.		
Type "L" Differential				
167-31-1	11	2.8	3	3/4"
167-32-1	27	3.5	7	61/64"
167-33-1	51	4.6	13	1 1/4"



Cat. No.	Nominal Capacity (pF)		Plates Per Sec.	L ± 1/32"
	Max.	Min.		
Type "L" Dual Section				
167-51-1	27	4.2	7	1 5/8"
167-52-1	51	5.4	13	2 15/64"
167-53-1	99	7.8	25	3 7/16"

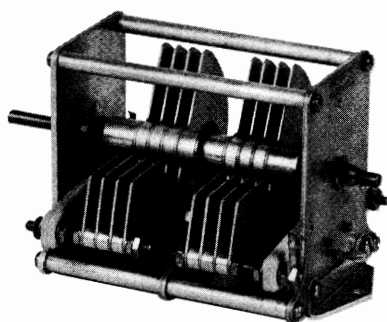
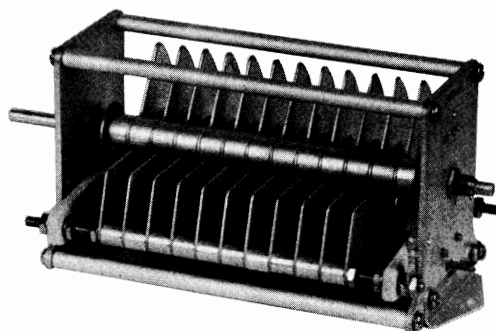
# AIR VARIABLE CAPACITORS

## TYPE "D" CAPACITORS

### JOHNSON CAPACITOR DIVISION

Heavy .051" aluminum plates, edges rounded for maximum withstanding voltage, and 5/16" diameter aluminum tie rods; 1/4" cadmium-plated steel shafts; laminated phosphor bronze contact springs; and steatite insulation. Type "D"—overall width: 4 1/4"—height:

4" — height bottom to shaft center: 2-5/32". Dual types have center rotor connection for better balance. End frames tapped 8-32, 3 holes, for panel mounting — brackets furnished for chassis mounting.



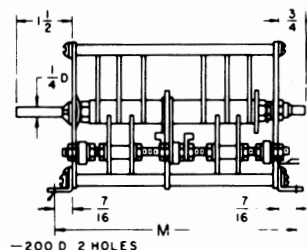
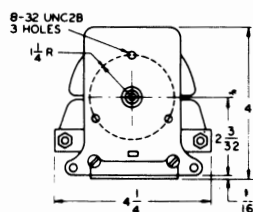
Cat. No.	Peak With- standing Voltage	Nominal Capacity (pF)		Air Gap	Plates Per Sec.	M ± 1/4"
		Max.	Min.			

#### Type "D" Single Section

153-6-1	3500	496	36	.080"	39	7 11/16"
153-8-1	4500	146	23	.125"	17	5 21/32"
153-11-1	7000	98	23	.175"	15	5 21/32"
153-12-1	7000	151	31	.175"	23	7 11/16"
153-13-1	7000	244	45	.175"	37	11 3/16"
153-15-1	9000	53	20	.250"	10	5 21/32"
153-16-1	9000	73	25	.250"	14	6 11/16"
153-17-1	9000	99	30	.250"	19	8 9/16"
153-18-1	9000	149	43	.250"	29	11 3/16"

#### Type "D" Dual Section

153-501-1	3500	95	13	.080"	8	5 21/32"
153-502-1	3500	147	15	.080"	12	6 11/16"
153-503-1	3500	202	19	.080"	16	8 9/16"
153-504-1	3500	291	24	.080"	23	10 11/32"
153-505-1	3500	496	38	.080"	39	14 7/32"
153-506-1	4500	155	24	.125"	17	10 11/32"
153-507-1	4500	198	27	.125"	23	13 1/16"
153-508-1	7000	52	15	.175"	8	6 11/16"
153-509-1	7000	72	17	.175"	11	8 9/16"
153-510-1	7000	97	22	.175"	15	10 11/32"
153-511-1	7000	151	31	.175"	23	14 7/32"
153-513-1	9000	52	19	.250"	10	10 11/32"
153-514-1	9000	97	30	.250"	19	15 23/32"



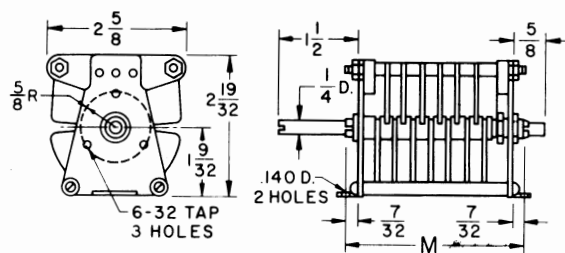
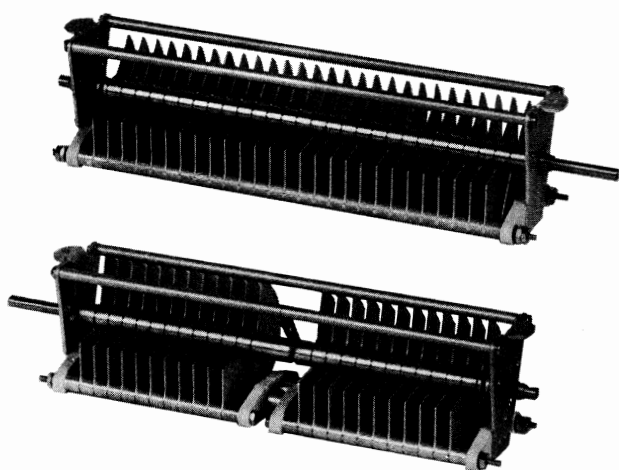
# AIR VARIABLE CAPACITORS

## JOHNSON CAPACITOR DIVISION

## TYPE "E" CAPACITORS

High capacity per cubic inch and extremely low capacity to chassis. Heavy aluminum plates .032" thick with rounded edges and large 1/4" tie rods; stainless steel shafts; sturdy phosphor

bronze contact springs; and center rotor contact on dual types. End frames tapped 6-32, 3 holes for panel mounting — brackets furnished for chassis mounting.



Cat. No.	Peak With- standing Voltage	Nominal Capacity (pF)		Air Gap	Plates per sec.	M±3/64"
		Max.	Min.			
Type "E" Single Section						
154-1-1	2000	244	12	.045"	23	3 7/32"
154-2-1	2000	353	15	.045"	33	3 31/32"
154-3-1	2000	488	19	.045"	45	4 29/32"
154-7-1	3000	100	11	.075"	15	3"
154-8-1	3000	154	14	.075"	23	3 7/8"
154-9-1	3000	251	20	.075"	37	5 3/8"
154-10-1	3000	347	25	.075"	51	6 7/8"
154-11-1	4500	38	9	.125"	9	2 3/4"
154-12-1	4500	53	11	.125"	12	3 13/32"
154-13-1	4500	74	13	.125"	17	4 1/32"
154-14-1	4500	101	16	.125"	23	4 31/32"
154-15-1	4500	145	20	.125"	33	6 17/32"
154-16-1	4500	241	32	.125"	55	10"
154-30-1	1500	1000	18	.030"	63	5 23/64"

<b>Type "E" Dual Section</b>						
154-502-1	2000	312	13	.045"	29	7 3/32"
154-503-1	3000	52	8	.075"	8	4 17/32"
154-504-1	3000	72	8	.075"	11	4 31/32"
154-505-1	3000	99	10	.075"	15	5 13/16"
154-506-1	3000	153	13	.075"	23	7 1/2"
154-507-1	3000	196	15	.075"	29	8 13/32"
154-508-1	4500	52	10	.125"	12	6 19/32"
154-509-1	4500	74	12	.125"	17	7 7/8"
154-510-1	4500	100	15	.125"	23	9 23/32"

**CARDWELL CONDENSER CORPORATION**  
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