

# Electrically Compensated Capacity Control Package

## DESCRIPTION

Electrically-actuated capacity control packages listed in Table 1 are used with a 5F,H and 06L compressors except 5F20,30 and 5H120 prior to serial no. 0447119. Control packages can be used on 5H120 beginning with the above serial number.

Application of control package provides means of changing control point at which compressor starts to unload by automatically rotating compressor capacity control adjusting stem. An electric modulating motor is utilized which is connected to adjusting stem thru gears, and is controlled by signals from a control device. See Table 2 and Fig. 1 for control package components

**Table 1 – Capacity Control Package Data and Usage**

CONTROL PACKAGE	VOLTS* (60-Hz)	TIMING (Min)	MOTOR MOVEMENT RANGE (Deg)	COMPRESSOR UNIT
5F40-777	115	4	160	5F40,60
5F40-787			180	5F40,60
5H40-A203			160	5H40,46,60,66,80,86
5H40-A213			180	5H40,46,60,66,80,86
5H120-A213			180	5H120,126
6L40-957			160	06L (All)
6L40-967			180	06L (All)
5F40-807	230	4	160	5F40,60
5H40-A673			160	5H40,46,60,66,80,86
5H120-A673			180	5H120,126
5H40-A663			160	06L (All)
			160	

☐ Packages used with Honeywell Series 90 controls. Remaining packages used with Barber-Colman TP and EYDQ series controls

\*Motor operates at 24 volts. Control package equipped with 115-volt to 24-volt transformer

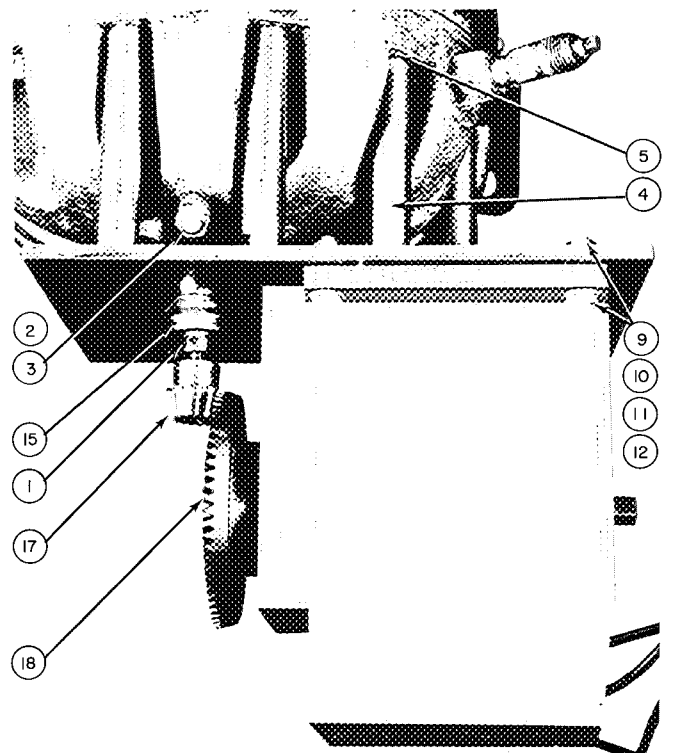
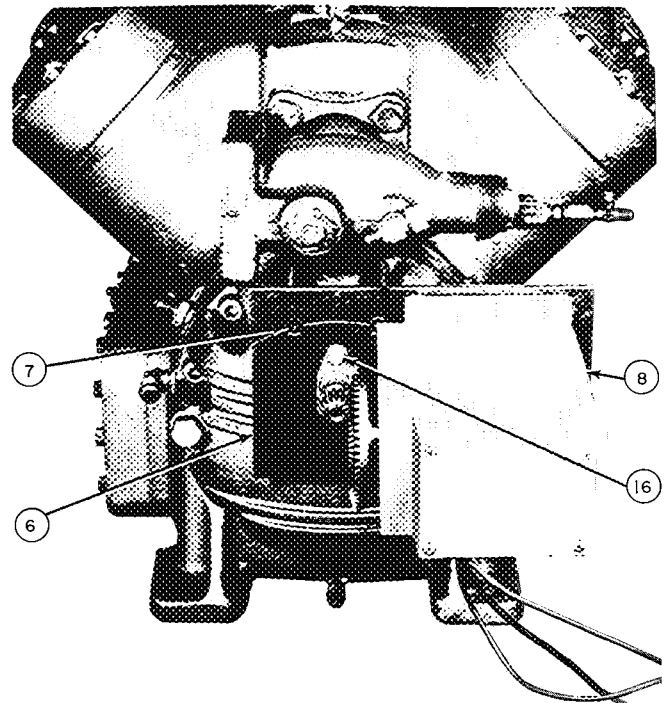
**Table 2 – Capacity Control Package Components**

ITEM	DESCRIPTION	REQUIRED
1	Outer Control Valve Housing	1
2	Grease Fitting	1
3	Reducing Bushing	1
4	Mounting Plate Support Bolts	4
5	Gasket, Cap Screw	4
6	Motor Mounting Plate	1
7	Flat Head Screws, 1/4-20 x 1/2 lg	4
8	Modulating Motor*	1
9	Cap Screws, 1/4-20 x 1 lg	4†
10	Nut, Hex, 1/4-20	4†
11	Washers, Plain, 1/4	4†
12	Washer, Lock, 1/4	4†
13	Transformer‡	1
14	Relay‡	1
15	Flanged Support Bearing	1
16	Cap Screws, Hex, 1/4-20 x 3/8 lg	2
17	Pinion Gear	1
18	Bevel Gear	1

\*Barber-Colman or Honeywell motor

†Packages 5F40-787, 5H40-A213, 5H120-A213, 6L40-967, 5H120-A673 require 3 of items 8, 9, 10, 11

‡Transformer and relay supplied only in packages 5F40-777, 5H40-A203, 6L40-957, 5F40-807, 5H40-A673, 5H40-A663 and are mounted remote from compressor. These items are integral part of modulating motor in remaining packages



Numbered callouts refer to item numbers in Table 2

**Fig. 1 – Electric Capacity Control Assembled  
On 5H40 Compressor**

## INSTALLATION

1. Pump down compressor by closing suction stop valve and reducing crankcase pressure to 2 psig. Stop compressor and close discharge stop valve. Bleed residual refrigerant.
2. Remove capacity control valve outer housing, including valve stem and traveling nut from compressor. Replace it with outer control valve housing (includes longer stem with traveling nut), item 1, as shown in Fig. 1. Make sure that new valve stem is lubricated; see Service section.
3. Install grease fitting, item 2, in threaded crankcase connection above the control valve plate. Compressors 5H40, 46, 60, 66, 80 and 86 require grease fitting reducing bushing, item 3.
4. Remove compressor pump end bearing head cover bolts (5H,06L) or hand hole cover bolts (5F) from locations shown in Fig. 2. Install mounting plate support bolts with cap screw gaskets, items 4 and 5 (Fig. 1) in same threaded holes.
5. Fasten motor mounting plate, item 6, to support bolts with flat head screws, item 7. On 5H120, 126 and 06L applications, rotate suction valve clockwise to clear mounting plate. Fasten modulating motor, item 8, loosely to mounting plate; use cap screws, nuts and washers, items 9 thru 12.
6. Mount transformer and relay, items 13 and 14, (when supplied separate from modulating motor) remote from compressor in control center.
7. Install control valve stem support bearing, item 15, on mounting plate using cap screws, item 16. Turn stem in bearing to ensure no binding occurs.
8. Open compressor suction and discharge stop valves and start compressor.
9. Adjust capacity control valve stem until all controlled cylinders are just loaded at design suction pressure (control point). See Capacity Control Adjustment. After fully loaded condition is obtained, shut compressor off.
10. Connect 115-volt line power leads to modulating motor or primary transformer connections as shown in Fig. 3. Connect control power leads to low voltage terminals.
11. Energize motor and check for proper shaft rotation. A pressure or temperature at control device lower than device setting causes a counterclockwise shaft rotation. Pressure or temperature higher than setting causes a clockwise shaft rotation. Before installing drive gears, de-energize motor with shaft at extreme clockwise limit of travel.
12. Position pinion gear, item 17, on control valve stem, and bevel gear, item 18, on motor shaft. Position motor and pinion gears so teeth mesh properly; secure motor to support plate and tighten setscrews on gears and support bearing.

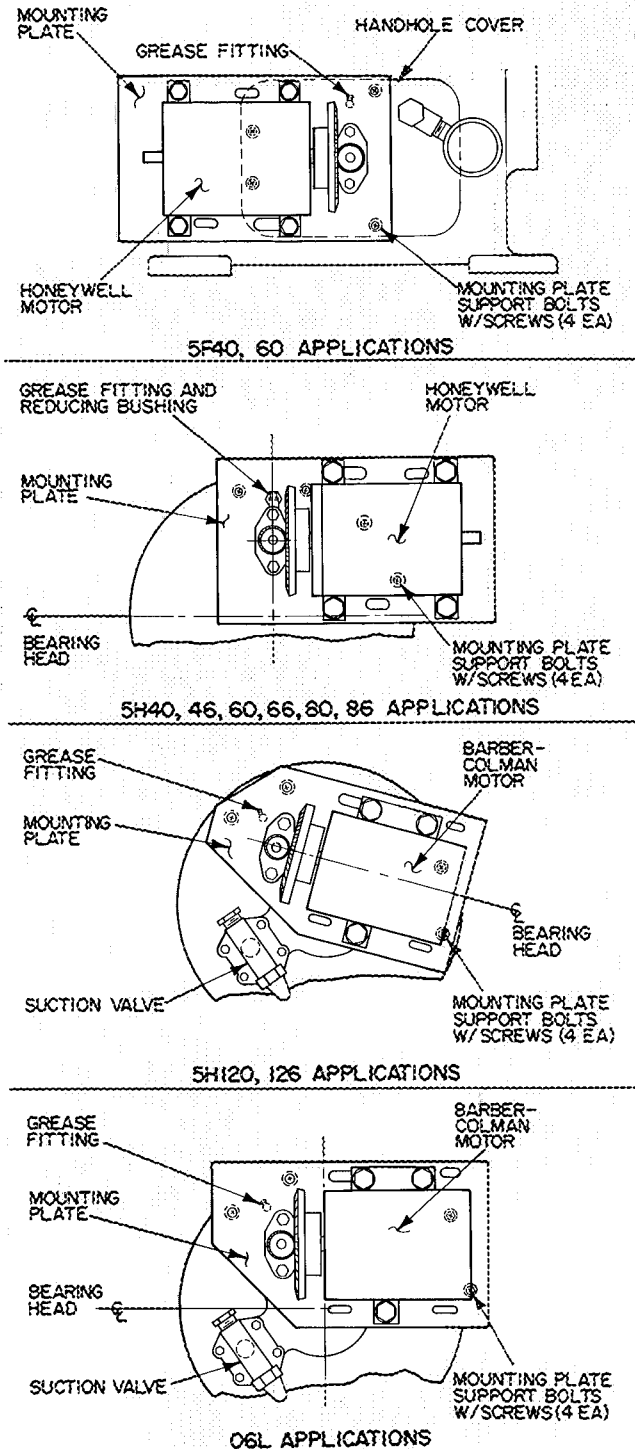


Fig. 2 - Electric Capacity Control Installation Diagrams

## CAPACITY CONTROL ADJUSTMENT

Design suction pressure is the control point at which the first step of cylinder unloading occurs. Control point is adjustable from 0 to 50 psig on R-12 and R-500 systems; 0 to 85 psig on R-22 and R-502 systems.

1. Load compressor until suction pressure is above control point.

2. Reduce suction pressure to control point by slowly closing suction service valve.
3. At control point, turn adjusting stem clockwise until first step of unloading occurs. Observe change in compressor sound, control oil pressure and current draw.
4. Turn adjusting stem slowly counterclockwise just until control cylinders reload at control point.

Refer to 5F,H or 06L,07L Start-Up and Service Instructions for further details if required.

### OPERATION

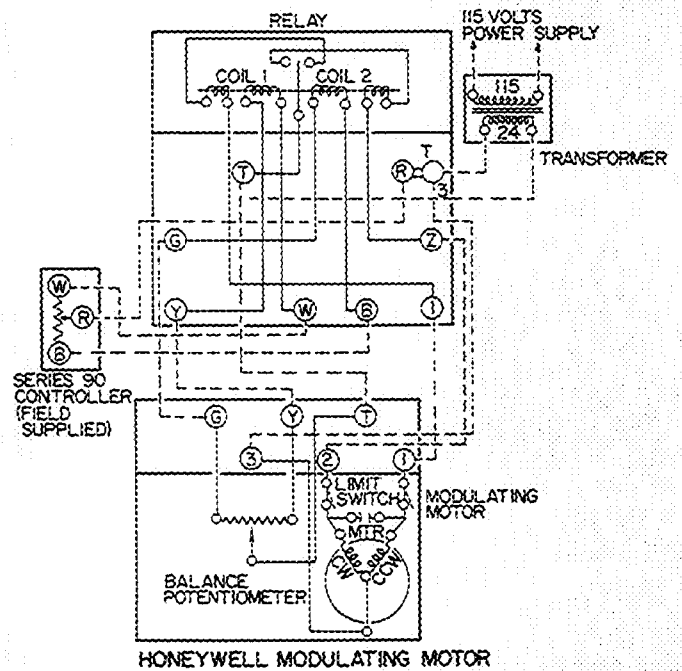
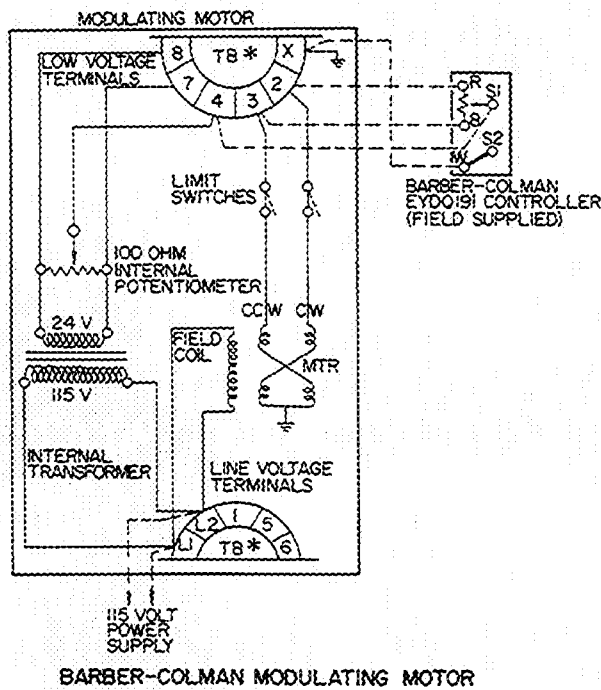
The modulating motor and gear train provides 2 full turns of capacity control stem in 4 minutes. These 2 turns will move control point thru a range of 16 psi for R-12 and R-500; 22 psi for R-22 and R-502

Modulating motor operation is controlled by a temperature or pressure sensing controller (field

supplied) which reacts to changes in conditions being controlled. If control device calls for less compressor capacity, motor turns capacity control stem *clockwise*, raising compressor unloading control point. As control point is increased, compressor cylinders unload until compressor capacity meets system requirements. When control device calls for more compressor capacity, motor turns capacity control stem *counterclockwise*, lowering compressor unloading control point. As control point is lowered, compressor cylinders load until compressor capacity meets new system requirements.

### SERVICE

**Lubrication** – Make certain that new valve stem is lubricated at threads and packing area. To lubricate remove stem from compressor and apply a combination of lubricating oil and silicone base lubricant. Apply lubricant semiannually thru grease fitting.



\*One piece, circular terminal block split for wiring diagram only. Barrier between line and low voltage terminals at split in diagram.

————— Factory Wiring (Internal)    - - - - Field Wiring (External)

Fig. 3 – Typical Wiring Diagrams

For replacement items use Carrier specified parts.  
Manufacturer reserves the right to change any product specifications without notice.

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