

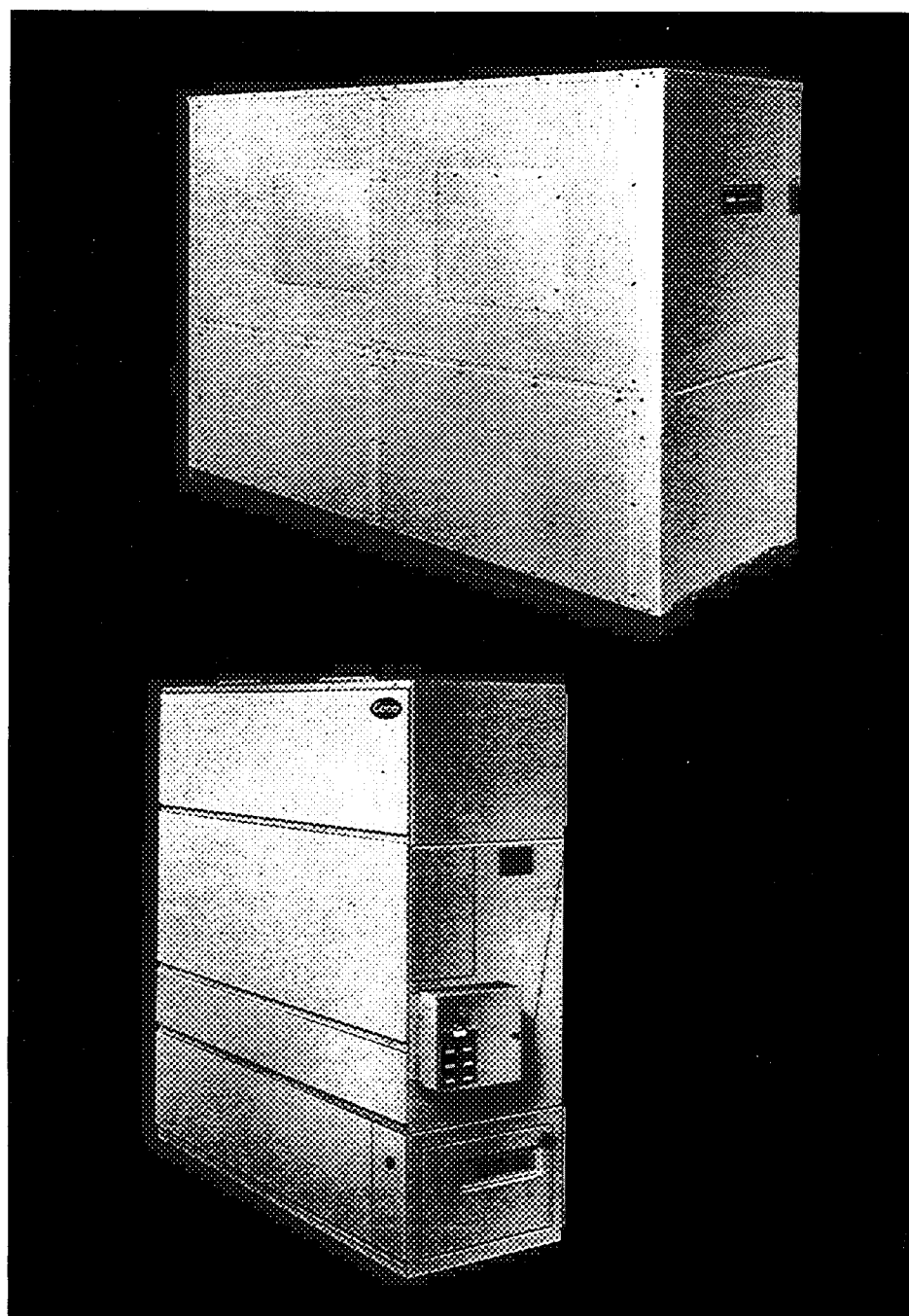


Product Data

50BJ,BK

Indoor Packaged Cooling — Variable Air Volume System

15 to 60 Nominal Tons



The Ideal System for Variable Air Volume, Constant Temperature Applications

- floor by floor building comfort
- design flexibility
- variable air volume savings
- microprocessor-based controls
- single-package economy

Features/Benefits

Floor-by-floor design flexibility

Carrier's 50BJ,BK units offer the maximum design flexibility for new construction, replacement and renovation jobs. Individual floors can be occupied, one at a time, as the units are installed. Individual tenant utility metering is also available. Whenever interior layouts are updated or modified, the 50BJ,BK systems allow for quick and easy changes without disrupting the other building occupants

Operating savings

Whether you choose the 50BJ water-cooled unit or 50BK condenserless model, you'll get a package that can cool, dehumidify, and circulate air — all under a microprocessor master control that assures minimum energy consumption at full and part load.

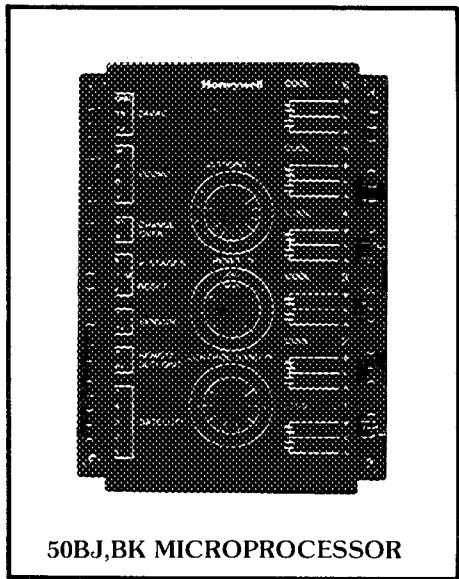
The 50BJ,BK units have an advanced solid-state microprocessor system that assures maximum operating economy. This computer brain constantly monitors unit discharge air temperature and compares it with conditioned space temperatures. Logic circuits then sequence unit start, stop and cooling stages to provide just the amount of mechanical cooling necessary for stable, comfortable conditioned space temperatures.

The microprocessor control provides more precise control over the leav-

ing air temperature by narrowing the throttling range around the set point. This is the most important ingredient in true energy saving systems. Using this microprocessor, a truly integrated field-supplied air or water side economizer is possible.

Additional savings are available on the 40 to 60 ton units by ordering the inlet guide vane option. All hardware and associated controls are factory installed.

All 50BJ models are available with a factory-installed hydronic economizer option. An aquastat senses the cooling tower water, and, if the water temperature is low enough, circulates it through a water cooling coil in the unit. This keeps the compressors off for longer periods of time and provides additional unit operating savings.



50BJ,BK MICROPROCESSOR

Convenient installation and minimum maintenance

Carrier's 50BJ,BK units serve any building. schools, offices, libraries, or high rises. Just set the packaged cooling unit in the equipment room or conditioned space, attach the ductwork and install the self-contained system-powered Moduline or Modubox VAV terminals.

The 50BJ,BK cooling unit in its rugged compact package can be placed in a variety of locations, whether in the equipment room or the conditioned space. Each of the 7 sizes can be installed with either vertical or horizontal air discharge. The factory-installed piping and the prewired electrical center simplify field connections.

The units are designed to provide years of trouble-free service with low maintenance.

All components of the 50BJ,BK indoor unit are mounted on a sturdy steel frame encased in a Weather Armor cabinet of heavy-gage, galvanized steel. This rugged construction provides strength and durability and affords excellent protection against damaging dirt or moisture.

Easy-to-remove panels provide complete access to internal components and controls. The time-tested serviceable hermetic compressors are sealed against dirt and moisture contamination. Their precision parts have minimum-wear surfaces that are thoroughly protected by positive pressure lubrication.

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Quality-engineered features assure outstanding performance

Dual Carrier serviceable compressors (50BJ,BK024-064 only)

deliver quiet, reliable high cooling capacities at low cost. The Time Guard® circuit, a Carrier exclusive, eliminates short cycling and simultaneous start-up of compressors if any of the safety devices open. This feature minimizes power surges.

Automatic capacity control at partial load is provided by electric unloaders and compressor cycling that tailor cooling capacity to cooling requirements. A temperature-actuated microprocessor cycles the electric unloaders and compressors to ensure positive control of the supply air temperature as it leaves the unit. The result is lower operating cost.

Positive compressor protection is assured on all units by the use of

calibrated, single-phase protection circuit breakers, high- and low-pressure switches and internal protection (units 016-034) or discharge gas thermostat (units 044-064).

Crankcase heaters (50BJ044-064 and 50BK016-064) are energized during the compressor off-cycle to reduce dilution of oil by refrigerant.

Intertwined evaporator coil for better cooling and dehumidification at part load. Modu-Vac system refrigerant circuiting features an evaporator coil with intertwined design. This allows each refrigerant circuit to chill the entire coil face and depth. If one circuit shuts down for part load operation, the full finned surface of the coil still remains cool, providing controlled space conditions even at light load.

Forward-curved fans move large volumes of indoor air quietly and at a lower rpm than most comparable fans. The compact housing gives the

fans superior capability for vertical or horizontal supply air discharge

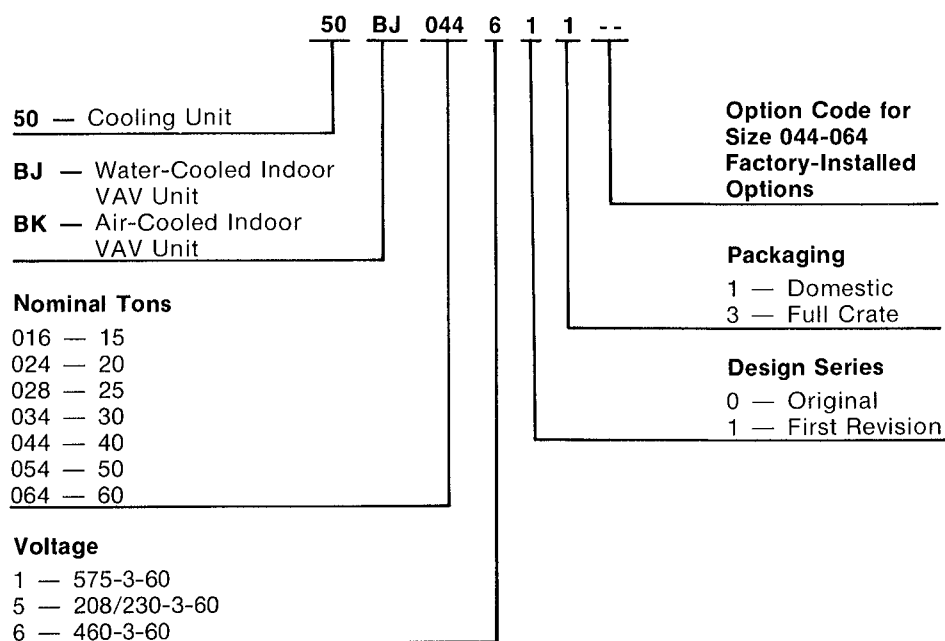
High-efficiency condensers provide maximum exposed heat-exchange surface for greater heat rejection with less water consumption.

Hot gas bypass reduces evaporator coil freeze-up at very low loads. Hot gas bypass refrigerant control assures reliable cooling operation on those rare occasions when the load drops to extremely low levels. During those low load periods, when the system is experiencing minimum airflows, the hot gas bypass valve allows space condition to remain comfortable.

Pre-wired electrical control center contains all control devices. Terminal block provides for a single-point field power connection.

Outdoor fan relay is shipped with 50BK016 and 024 units and is factory installed on 50BK044-064 units.

Model number nomenclature



Physical data

MODEL 50	BJ BK		BJ BK		BJ BK		BJ BK		BJ BK		BJ BK		BJ BK	
	016		024		028		034		044		054		064	
NOMINAL CAPACITY (tons)	15		20		25		30		40		50		60	
OPERATING WEIGHT (lbs)	1420	1225	1900	1470	2500	2335	2610	2440	3660	3155	3888	3298	4030	3305
OPERATING CHARGE (lbs) (Note 1)	Refrigerant 22													
System 1	24	15	17	7	24	15	24	15	30	18	45	18	40	18
System 2	—	—	17	7	17	12	24	15	30	18	35	18	40	18
COMPRESSOR — TYPE 06	Serviceable Hermetic, 1750 Rpm													
System 1	DC337	DC537	DC724	DC824	DC337	DC537	DC337	DC537	E2150	E2250	E7265	E7265	E7175	E7275
System 2	—	—	DA724	DA824	DA724	DA824	DA337	DA537	EA150	EA250	EA150	EA250	EF175	EF275
No. of Unloading Cylinders	4	—	4	—	4	—	4	—	2	—	4	—	4	—
No. of Capacity Steps	3	—	6	—	6	—	6	—	4	—	6	—	6	—
HPS Setting (psig)	280	376	280	376	280	376	280	376	395	—	395	—	395	—
LPS Setting (psig)	27	—	27	—	27	—	27	—	27	—	27	—	27	—
STANDARD CONDENSER (BJ Only)														
No. Type	1 SC	—	2 SC	—	2 SC	—	2 SC	—	2 TT	—	2 TT	—	2 TT	—
Max. Working Pressure (psig)	550	—	150 (Note 2)	—	550	—	550	—	400	—	400	—	400	—
Connection Size (in.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Water Inlet (Quantity) Size.. Type	(1) 2 FPT	—	(1) 2 5 FPT	—	1 5 + 2 FPT	—	(2) 2 FPT	—	(2) 2 1/2 IDF	—	(2) 2 1/2 IDF	—	(2) 2 1/2 IDF	—
Water Outlet (Quantity) Size.. Type	(1) 2 FPT	—	(1) 2 5 FPT	—	1 5 + 2 FPT	—	(2) 2 FPT	—	(1) 3 1/2 IDF	—	(1) 3 1/2...IDF	—	(1) 3 1/2...IDF	—
OPTIONAL CONDENSER (BJ Only)														
No. Type	—	—	—	—	—	—	—	—	2 ST	—	2 ST	—	2 ST	—
Max. Working pressure (psig)	—	—	—	—	—	—	—	—	150	—	150	—	150	—
Connection Size (in.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Water Inlet (Quantity) Size.. Type	—	—	—	—	—	—	—	—	(2) 2 FPT	—	(1) 2, (1) 2 5 FPT	—	(2) 2 5 FPT	—
Water Outlet (Quantity) Size... Type	—	—	—	—	—	—	—	—	(2) 2 FPT	—	(1) 2, (1) 2 5 FPT	—	(2) 2 5 FPT	—
CONDENSER (BK Only)	Size (in.) Type													
Connection Size — (in.)														
Liquid	3/8 ODM	—	(2) 3/8 ODM	—	(2) 3/8 ODM	—	(2) 3/8 ODM	—	(2) 3/8 ODS	—	(2) 3/8 ODS	—	(2) 3/8 ODS	—
Discharge	1 1/8 ODM	—	(2) 1 1/8 ODM	—	3/8 + 1 1/8 ODM	—	(2) 1 1/8 ODM	—	(2) 1 1/8 ODS	—	(2) 1 1/8 ODS	—	(2) 1 1/8 ODS	—
CONDENSATE CONNECTION	Size (in.) Type													
Condensate Drain	1 FPT	—	1 FPT	—	1 1/4 MPT	—	1 1/4 MPT	—	1 1/2 FPT	—	1 1/2 FPT	—	1 1/2 FPT	—
INDOOR FAN (Note 3)	Adjustable, Belt-Driven Centrifugal; 1750 Rpm Motor													
Number	2	—	2	—	2	—	2	—	2	—	2	—	2	—
Size (in.)	15 x 11	—	15 x 11	—	18 x 18	—	18 x 18	—	20 x 10	—	20 x 18	—	20 x 18	—
Nominal Cfm	6,000	—	8,000	—	10,000	—	12,000	—	16,000	—	20,000	—	24,000	—
Maximum Allowable Rpm	1200	—	1200	—	1100	—	1100	—	1200	—	1200	—	1200	—
No of Belts.. Fan Pulley PD (in.) (Note 4)	1 9/0	—	2 9/0	—	2 10/6	—	2 10/6	—	2 18/7	—	2 18/7	—	2 18/7	—
Fan Shaft Diameter — (in.)	1 3/16	—	1 3/16	—	1 11/16	—	1 11/16	—	1 11/16	—	1 11/16	—	1 11/16	—
Horsepower	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Standard Frame Size	3 182T	—	5 184T	—	7 5 213T	—	7 5 213T	—	15 254T	—	20 264T	—	25 284T	—
Motor Pulley A Diameter	4 5-5 5	—	4 6-5 6	—	5 6	—	5 6	—	9 0	—	9 8	—	9 8	—
Motor Pulley B Diameter	—	—	—	—	6 5	—	6 5	—	10 3	—	10 9	—	10 9	—
Motor Efficiency (%)	79	—	84	—	84	—	84	—	85	—	87	—	89	—
Motor Shaft Diameter (in.)	1 1/8	—	1 1/8	—	1 3/8	—	1 3/8	—	1 3/8	—	1 3/8	—	1 3/8	—
Center To Center (standard & horizontal)	8 8-11 1	—	8 8-11 1	—	29 8-33 3	—	29 8-33 3	—	17 9-21 1	—	17 9-21 1	—	17 0-20 4	—
Center To Center (alternate top discharge)	—	—	—	—	—	—	—	—	18 4-22 0	—	18 4-22 0	—	17 6-21 5	—
Fan Speed Range (Rpm)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pulley A	875-1069	—	894-1089	—	925	—	925	—	840	—	915	—	922	—
Pulley B	—	—	—	—	1073	—	1073	—	961	—	1023	—	1032	—
Alternate. Frame Size	5 184T	—	7 5 213T	—	10 215T	—	10 215T	—	20 256T	—	25 284T	—	30 286T	—
Motor Pulley A Diameter	—	—	—	—	—	—	—	—	10 9	—	10 9	—	10 9	—
Motor Pulley B Diameter	—	—	—	—	—	—	—	—	11 8	—	11 8	—	11 8	—
Fan Speed Range (Rpm)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pulley A	—	—	—	—	—	—	—	—	1023	—	1032	—	1029	—
Pulley B	—	—	—	—	—	—	—	—	1107	—	1117	—	1114	—
INDOOR COIL	Copper Tubes — Aluminum Plate Fins													
No of Rows Fins/in	3 11 0	—	4 11 0	—	4 9 0	—	4 9 0	—	3 15	—	4 15	—	4 15	—
Total Face Area (sq ft)	16 3	—	17 4	—	21 9	—	26 2	—	37 5	—	37 5	—	37 5	—
RETURN AIR FILTERS	Factory Supplied — Throwaway													
No Size (in.)	3 16x25x2	—	3 16x25x2	—	6 25x20x2	—	6 25x20x2	—	None	—	None	—	None	—
	3 20x25x2	—	3 20x25x2	—	2 16x20x2	—	2 16x20x2	—	(See Note 5)	—	(See Note 5)	—	(See Note 5)	—

Cfm — Cubic Feet Per Minute
 FPT — Female Pipe Thread
 Hp — Horsepower
 IDF — Inside Diameter, Female (Solder)
 MPT — Male Pipe Thread
 ODM — Outside Diameter Male
 ODS — Outside Diameter Solder
 PD — Pitch Diameter
 PDR — Pitch Diameter Range
 Rpm — Revolutions Per Minute
 SC — Shell and Coil
 ST — Shell-In-Tube
 TT — Tube-In-Tube

NOTES:

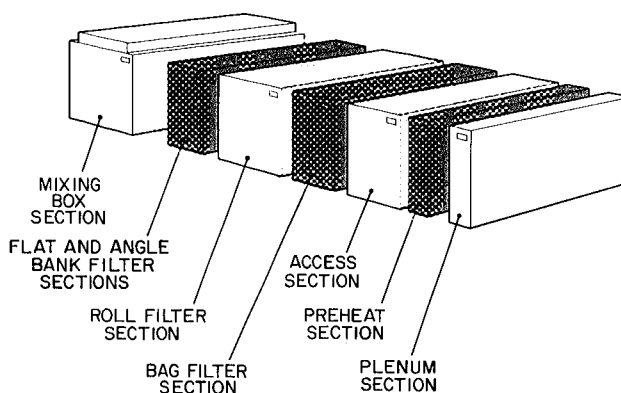
- Operating charge for 50BK units does not include charge for matching air-cooled condenser or refrigerant connecting piping. All 50BK units are shipped with a holding charge. Operating charge values are approximate. See Installation Instructions.
- Condenser working pressure is 550 psig if factory installed, dresser adapters are removed and field fabricated manifold is installed. Refer to 50BJ,BK Installation Instructions on condenser connections.
- Alternate motors and drives for units 016-034 must be purchased locally. Installation may require field modification. On sizes 044-064, alternate motor is available as a factory-installed option (except on size 064, 575-v unit).
- Fan motor pulleys on 50BJ,BK028,034,044,054,064 are fixed pitch type. The smaller of the 2 pulleys is factory installed on 044-064 units.
- Refer to 39E Series literature (size 39E36) for accessory information.

Options (factory-installed)

The following options are available for use on 50BJ,BK044-064 units:

- Inlet guide vanes for increased fan motor kW savings at part load
- Mechanically cleanable condensers (50BJ044-064 only)
- Alternate horizontal fan position for horizontal discharge applications
- Alternate motor and drive packages for high airflow and static requirements
- Alternate top discharge for upblast rear discharge

For 50BJ016-064 units, a hydronic economizer is available for additional energy savings.



39E ACCESSORIES AVAILABLE
ON 50BJ,BK044-064 UNITS

Accessories (field-installed)

Timer control panel includes a 7-day programmable clock with skip-a-day operation, 3 status lights for monitoring system modes and a 5-hour bypass timer for placing unit temporarily in occupied mode during otherwise unoccupied times. A 10-hour spring carryover function maintains operation during power failure.

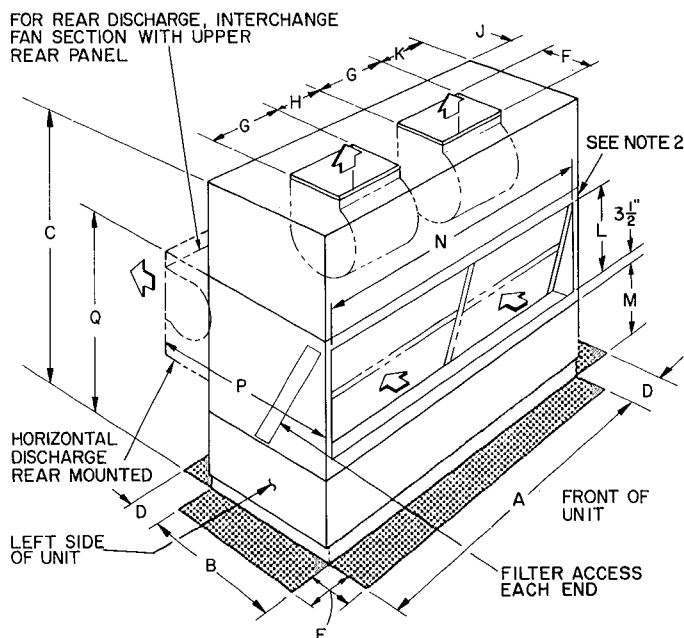
Return-air inlet grille (50BJ,BK016 and 024) adds an attractive touch to the front of the base unit when ductwork is not used. Hinged grille covers the filter opening with a decorative, easily attached, expanded metal panel.

Heating coils (50BJ,BK016 and 024) — One- and 2-row steam distributing coils and 2-row hot water coils are available.

Winter start-up package (50BK 044-064) provides a 3 minute time delay by shorting out the low-pressure switch on each compressor. This enables each compressor to start even during low ambient conditions.

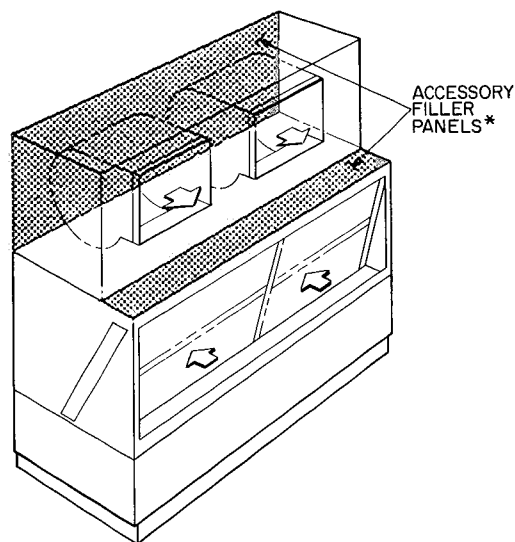
Accessory flexibility (50BJ,BK 044-064) — All 40-60 ton units are directly compatible with 39E (size 36) accessories. Refer to latest 39E Series literature for air filter, pre-heating coil and mixing box information.

Dimensions



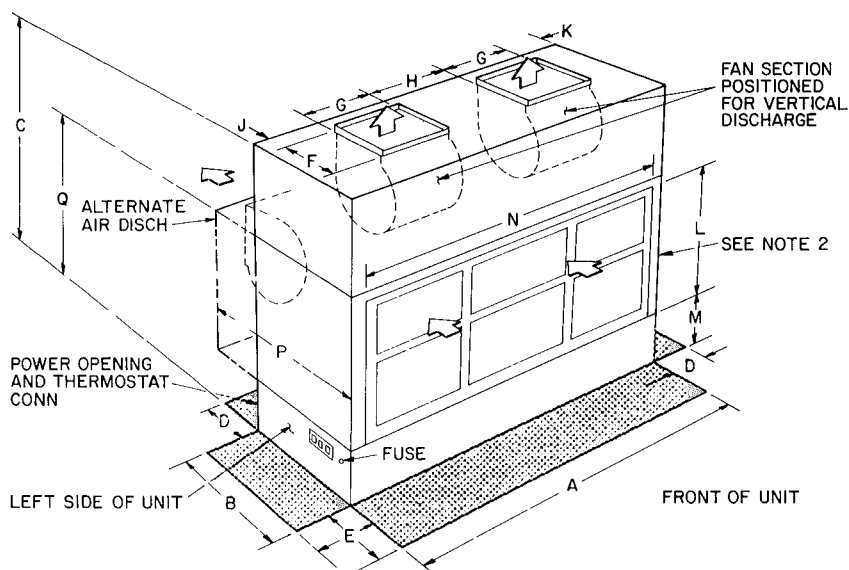
UNITS 50BJ,BK016 AND 024

OPTIONAL TOP HORIZONTAL DISCHARGE



*For optional top-mounted horizontal discharge, use accessory filler panel package as shown. See installation instructions.

Dimensions (cont)



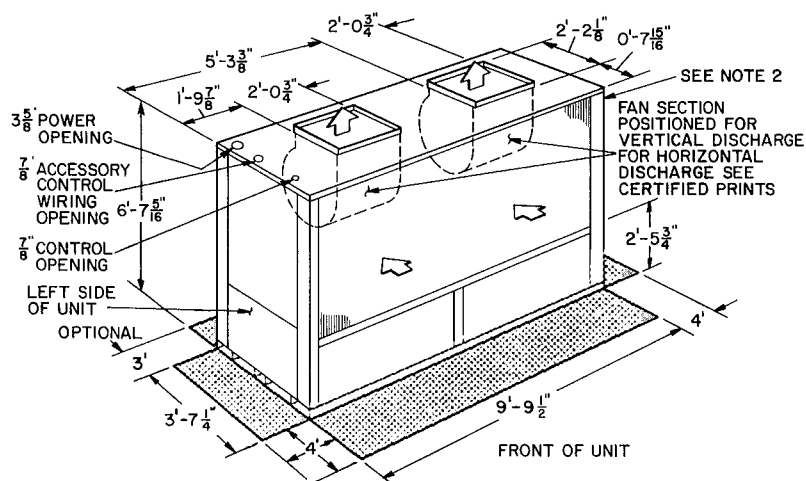
UNITS 50BJ, BK028 AND 034

DIMENSIONS (ft-in.)

UNIT 50BJ, BK	016	024	028	034
A	6-8		7- 9¼	
B	2-4		2-11¼	
C	6-10½		8- 0½	
D	2-0		2-0	
E	3-0		3-0	
F	1- 3¾		1- 8⅝	
G	1- 2⅝		1- 8⅝	
H	1- 4¼		1- 7⅝	
J	0- 2¾		0- 2¾	
K	2-0		1-4	
L	2-10¼		3- 2¼	
M	1-8		2- 1⅝	
N	6- 3¾		7- 4¼	
P	4- 4⅝		5- 4⅝	
Q	4-11½		5- 7¼	

 ACCESS AREA

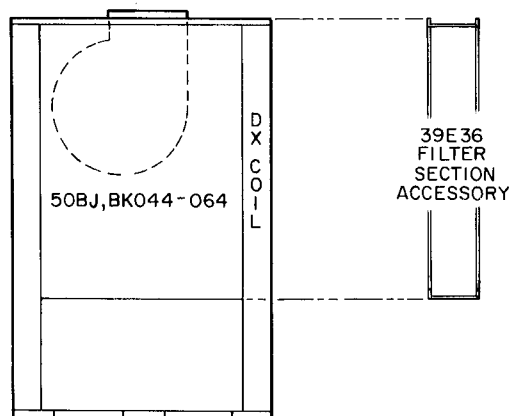
 AIRFLOW



UNITS 50BJ, BK044, 054 AND 064

NOTES:

- 1 Certified dimension drawings available on request
- 2 Water and refrigerant connections for Unit Sizes 50BJ, BK016 through 064 are located on right side of unit (facing coil)
- 3 Filters are not supplied with 044-064 base unit. All models are directly compatible with 39E (size 36) air-handling unit components. Refer to 39E literature for physical data for accessories (see diagram below)



39E ACCESSORY ASSEMBLY

NOTES

- 1 Accessory mounting screws are included with base unit
- 2 Refer to 39E Series literature for component selection and further details

Selection procedure (with example)

I Determine design conditions.

Given:

	50BJ Water- Cooled	50BK Air- Cooled
Total Cooling Capacity (TC/Btuh)	750,000	700,000
Sensible Cooling Capacity (SHC/Btuh)	615,000	600,000
Evaporator Air Quantity (cfm)	24,000	24,000
Entering Air Conditions (t _{edb})	82	82
(t _{ewb})	67	67
Entering Condenser Water Temp (t _{ew})	85	—
Entering Condenser Air Temp (t _{oa})	—	95
External Static Pressure (in. wg)	1.5	1.5

A. Water Cooled Selection Method — 50BJ

Enter the top and left side of the gross cooling capacity tables of the unit whose capacity is closest to the required capacity. Read down and across to obtain the following data:

Unit Selection — 50BJ064 selected at 24,000 cfm of 82/67 ent air.

TC = 762,000

SHC = 625,624 (See SHC Correction Table on this page)

Compressor Power Input = 53.5 kW

Condenser: Pressure drop — 10.8 ft

(t_{ew}) — 85 F

(gpm) — 180

B Air Cooled Selection Method — 50BK

Enter the top and left side of the gross cooling capacity tables of the unit whose capacity is closest to the required capacity. Read down and across to obtain the following data:

Unit Selection — 50BK064 selected at 24,000 cfm of 82/67 ent air.

TC = 704,000

SHC = 601,624 (See SHC Correction Table on this page)

Compressor Power Input = 59.9 kW

SCT = 125

II Determine required fan rpm and bhp.

A. Enter the Evaporator Fan Performance curve for the selected unit(s) at given air quantity (24,000 cfm) and external static pressure (1.5 in. wg). Find that for a 50BJ or 50BK064 units, fan rpm is 940 and required bhp is 22.2.

B. In the unit Physical Data table, check the factory-included indoor evaporator fan pulley speed ratings — 922 or 1032 rpm and nominal Hp (25) for the selected unit size. The standard fan drive package and motor fulfill the rpm and bhp requirements.

NOTES

- 1 Included with each 25-60 ton unit are 2 motor pulleys selected at different speeds. The smaller diameter pulley selected at the lower rpm is factory installed.
- 2 If unit selection requires an rpm out of standard package range, refer to fan pulley selection table, page 17.

Performance data

COOLING CAPACITY NOTES

- 1 All 50BJ,BK units are tested and rated in accordance with ARI Standard 360-86
- 2 Operation of 50BK016-034 above 140 F or 50BK044-064 above 145 F saturated condensing temperature is not recommended as it may cause nuisance tripping of the high-pressure switch
- 3 Gross capacities do not include deduction for indoor fan motor heat
- 4 All 50BJ gpm values are based on .0005 fouling factor using standard condensers
- 5 Direct interpolation is permissible. Do not extrapolate
- 6 All combinations use R-22. Unless otherwise designated, ratings are at optimum charge
- 7 Ratings for 50BK units are based on 15° of subcooling. For 0° subcooling reduce capacity by 7.5%
- 8 Most 50BK selections are based on a 30 F ΔT. Selections using over 40 F ΔT are not recommended (ΔT = SDT - EAT)
- 9 For 50BK units, THR = TC + (3.413) (compressor kW)

SHC CORRECTION FACTOR

SHC is based on 80 F db temperature of air entering evaporator coil. Below 80 F db, subtract (corr factor x cfm) from SHC.

Above 80 F db, add (corr factor x cfm) to SHC.

BYPASS FACTOR (BF)	ENTERING AIR DRY-BULB TEMPERATURE (F)					
	79	78	77	76	75	Under 75
	81	82	83	84	85	Over 85
Correction Factor						
.025	1.07	2.12	3.19	4.25	5.32	Use formula shown below
.05	1.04	2.07	3.11	4.14	5.18	
.10	.98	1.96	2.94	3.92	4.90	
.20	.87	1.74	2.62	3.49	4.36	
.30	.76	1.53	2.29	3.05	3.82	
.35	.71	1.42	2.13	2.83	3.54	

Interpolation is permissible

Correction Factor = 1.10 x (1 - BF) x (db - 80)

Performance data (cont)

GROSS COOLING CAPACITIES — WATER-COOLED UNIT

1 50BJ016

EWT	GPM	PRESSURE DROP			Evap Air — Cfm/BF											
					3000/.11			4500/ 15			6000/.19			7500/.22		
		Ft	Psi		Evap Air — Ewb Temp — (F)											
					72	67	62	72	67	62	72	67	62	72	67	62
65	13	1 6	0 7	TC SHC kW	178 84 14.0	161 99 13.7	145 113 13.3	194 94 14.6	178 116 14.2	162 138 13.8	203 105 14.8	186 133 14.4	170 161 14.0	210 114 14.9	192 148 14.6	176 176 14.2
	16	2 2	1 0	TC SHC kW	181 85 13.4	165 100 13.1	147 114 12.8	198 95 14.0	181 117 13.7	165 139 13.4	207 106 14.2	190 134 13.9	173 162 13.6	214 115 14.3	197 150 14.0	180 180 13.7
	21	3 3	1 4	TC SHC kW	187 87 12.7	168 102 12.5	151 116 12.3	201 96 13.4	184 118 13.0	167 141 12.8	210 107 13.5	193 135 13.3	176 163 13.0	217 117 13.6	201 151 13.3	183 182 13.0
75	16	2 2	1 0	TC SHC kW	173 82 14.7	157 97 14.4	141 111 13.9	190 92 15.2	173 114 14.9	158 136 14.4	198 103 15.4	182 131 15.1	167 159 14.6	204 113 15.6	188 146 15.2	173 173 14.8
	19	2 8	1 2	TC SHC kW	178 84 14.0	161 99 13.7	145 113 13.3	194 94 14.6	178 116 14.2	162 138 13.8	203 105 14.8	186 133 14.4	170 161 14.0	210 114 14.9	192 148 14.6	176 176 14.2
	26	5 2	2 3	TC SHC kW	181 85 13.4	165 100 13.1	147 114 12.8	198 95 14.0	181 117 13.7	165 139 13.4	207 106 14.2	190 134 13.9	173 162 13.6	214 115 14.3	197 150 14.0	180 180 13.7
85	20	3 0	1 3	TC SHC kW	170 81 15.3	153 96 15.0	138 110 14.5	— — —	168 113 15.6	154 134 15.1	— — —	178 129 15.9	161 157 15.4	— — —	— — —	167 167 15.6
	28	5 6	2 5	TC SHC kW	173 82 14.7	157 97 14.4	141 111 13.9	190 92 15.2	173 114 14.9	158 136 14.4	198 103 15.4	182 131 15.1	167 159 14.6	204 113 15.6	188 146 15.2	173 173 14.8
	35	8 0	3 5	TC SHC kW	178 84 14.0	161 99 13.7	145 113 13.3	194 94 14.6	178 116 14.2	162 138 13.8	203 105 14.8	186 133 14.4	170 161 14.0	210 114 14.9	192 148 14.6	176 176 14.2
95	37	8 8	3 8	TC SHC kW	170 81 15.3	153 96 15.0	138 110 14.5	— — —	168 113 15.6	154 134 15.1	— — —	178 129 15.9	161 157 15.4	— — —	— — —	167 167 15.6
	70	27 0	11 7	TC SHC kW	173 82 14.7	157 97 14.4	141 111 13.9	190 92 15.2	173 114 14.9	158 136 14.4	198 103 15.4	182 131 15.1	167 159 14.6	204 113 15.6	188 146 15.2	173 173 14.8

2 50BJ024

EWT	GPM	PRESSURE DROP			Evap Air — Cfm/BF											
					4000/.10			6000/ 15			8000/.18			10,000/ 21		
		Ft	Psi		Evap Air — Ewb Temp — (F)											
					72	67	62	72	67	62	72	67	62	72	67	72
65	17	1 7	0 8	TC SHC kW	230 110 17.2	208 129 17.0	187 149 16.6	250 125 17.7	228 153 17.3	208 181 16.9	264 136 17.9	241 173 17.5	220 211 17.1	271 150 17.9	249 195 17.7	227 227 17.5
	19	1 9	0 9	TC SHC kW	235 111 16.4	213 131 16.2	191 151 15.9	254 127 16.8	233 156 16.6	212 184 16.3	270 137 17.0	247 177 16.7	225 213 16.5	277 152 17.0	254 197 16.8	233 233 16.7
	23	2 9	1 3	TC SHC kW	240 114 15.4	218 133 15.3	196 153 15.2	260 130 16.1	238 158 15.9	217 186 15.7	276 141 16.3	253 179 16.0	231 216 15.8	284 154 16.3	260 199 16.1	239 239 16.0
75	23	2 9	1 3	TC SHC kW	230 110 17.2	208 129 17.0	187 149 16.6	250 125 17.7	228 153 17.3	208 181 16.9	264 136 17.9	241 173 17.5	220 211 17.1	271 150 17.9	249 195 17.7	227 227 17.5
	27	4 1	1 8	TC SHC kW	235 111 16.4	213 131 16.2	191 151 15.9	254 127 16.8	233 156 16.6	212 184 16.3	270 137 17.0	247 177 16.7	225 213 16.5	277 152 17.0	254 197 16.8	233 233 16.7
	40	7 0	3 2	TC SHC kW	240 114 15.4	218 133 15.3	196 153 15.2	260 130 16.1	238 158 15.9	217 186 15.7	276 141 16.3	253 179 16.0	231 216 15.8	284 154 16.3	260 199 16.1	239 239 16.0
85	23	2 9	1 3	TC SHC kW	221 106 19.0	200 126 18.6	179 145 18.2	238 120 19.6	218 148 19.1	199 177 18.6	252 132 19.8	230 170 19.3	210 205 18.9	259 147 19.9	236 191 19.5	216 216 19.0
	31	5 2	2 3	TC SHC kW	226 108 18.2	204 128 17.8	183 148 17.4	244 123 18.5	223 151 18.1	204 179 17.7	258 134 18.8	236 173 18.3	216 209 18.0	266 148 18.9	243 192 18.5	222 222 18.1
	38	6 6	3 0	TC SHC kW	230 110 17.2	208 129 17.0	187 149 16.6	250 125 17.7	228 153 17.3	208 181 16.9	264 136 17.9	241 173 17.5	220 211 17.1	271 150 17.9	249 195 17.7	227 227 17.5
95	38	6 6	3 0	TC SHC kW	221 106 19.0	200 126 18.6	179 145 18.2	238 120 19.6	218 148 19.1	199 177 18.6	252 132 19.8	230 170 19.3	210 205 18.9	259 147 19.9	236 191 19.5	216 216 19.0
	63	16 5	7 2	TC SHC kW	226 108 18.2	204 128 17.8	183 148 17.4	244 123 18.5	223 151 18.1	204 179 17.7	258 134 18.8	236 173 18.3	216 209 18.0	266 148 18.9	243 192 18.5	222 222 18.1

GROSS COOLING CAPACITIES — WATER-COOLED UNIT

3	50BJ028															
EWT	GPM	PRESSURE DROP			Evap Air — Cfm/BF											
		5000/.11			7500/.15			10,000/.18			12,500/.21					
		Evap Air — Ewb Temp — (F)														
		72	67		62	72	67	62	72	67	62	72	67	62		
65	27	2 6	1 1	TC SHC kW	291	262	234	324	298	268	343	313	285	352	322	293
					139	164	186	159	199	231	178	224	269	192	250	293
					21.4	21.0	20.7	22.4	21.9	21.6	22.7	22.2	21.8	22.8	22.4	21.9
	32	3 4	1 5	TC SHC kW	298	269	241	329	304	272	349	319	290	358	328	298
					142	166	189	161	200	233	180	225	271	195	252	298
					20.3	20.0	19.7	21.4	21.0	20.7	21.7	21.3	20.9	21.9	21.5	21.0
	32	3 4	1 5	TC SHC kW	286	256	229	318	290	262	335	306	278	344	315	287
					136	116	184	126	193	228	175	222	266	189	246	287
					22.5	22.0	21.6	23.5	22.8	22.4	23.9	23.2	22.7	24.2	23.4	22.8
75	41	5 2	2 3	TC SHC kW	291	262	234	324	298	268	343	313	285	352	322	293
					139	164	186	159	199	231	178	224	269	192	250	293
					21.4	21.0	20.7	22.4	21.9	21.6	22.7	22.2	21.8	22.8	22.4	21.9
	58	9 5	4 1	TC SHC kW	298	269	241	329	304	272	349	319	290	358	328	298
					142	166	189	161	200	233	180	225	271	195	252	298
					20.3	20.0	19.7	21.4	21.0	20.7	21.7	21.3	20.9	21.9	21.5	21.0
	31	3 2	1 4	TC SHC kW	272	244	217	—	274	247	—	292	265	—	—	277
					131	155	178	—	179	213	—	202	250	—	—	277
					24.7	24.0	23.4	—	25.0	24.2	—	25.5	24.8	—	—	24.9
85	40	5 0	2 2	TC SHC kW	278	250	224	310	283	254	328	299	271	338	309	280
					134	158	181	153	191	224	172	219	263	188	244	280
					23.7	23.1	22.4	24.5	23.9	23.3	24.9	24.3	23.7	25.1	24.5	23.8
	56	8 7	3 9	TC SHC kW	286	256	229	318	290	262	335	306	278	344	315	287
					136	116	184	126	193	228	175	222	266	189	246	287
					22.5	22.0	21.6	23.5	22.8	22.4	23.9	23.2	22.7	24.2	23.4	22.8
	55	8 7	3 8	TC SHC kW	272	244	217	—	274	247	—	292	265	—	—	277
					131	155	178	—	179	213	—	202	250	—	—	277
					24.7	24.0	23.4	—	25.0	24.2	—	25.5	24.8	—	—	24.9
95	102	24 8	10 7	TC SHC kW	278	250	224	310	283	254	328	299	271	338	309	280
					134	158	181	153	191	224	172	219	263	188	244	280
					23 7	23 1	22 4	24 5	23 9	23 3	24 9	24 3	23 7	25 1	24 5	23 8

4	50BJ034															
EWT	GPM	PRESSURE DROP			Evap Air — Cfm/BF											
					6000/ 11			9000/ 15			12,000/.18			15,000/ 21		
		Evap Air — Ewb Temp — (F)														
		72	67		62	72	67	62	72	67	62	72	67	62		
65	34	2 5	1 1	TC SHC kW	352	316	282	394	360	325	414	380	346	424	394	359
					166	196	222	192	237	278	223	283	335	244	310	359
					26 6	26 0	25 6	28 0	27 3	26 5	28 4	27 7	27 0	28 6	28 0	27 3
75	41	3 4	1 5	TC SHC kW	359	323	289	399	364	329	419	384	350	429	397	363
					169	198	226	194	239	280	225	285	338	246	313	363
					25.2	24.8	24.4	26.7	26.1	25.3	27.1	26.5	25.8	27.3	26.8	26.1
75	40	3 2	1 4	TC SHC kW	345	309	276	382	350	316	405	370	337	416	382	349
					163	192	218	187	233	274	220	280	332	242	308	349
					27.8	27.2	26.6	29.4	28.5	27.6	29.8	29.1	28.2	30.1	29.4	28.5
75	54	5 3	2 3	TC SHC kW	352	316	282	394	360	325	414	380	346	424	394	359
					166	196	222	192	237	278	223	283	335	244	310	359
					26.6	26.0	25.6	28.0	27.3	26.5	28.4	27.7	27.0	28.6	28.0	27.3
75	78	10 0	4 3	TC SHC kW	359	323	289	399	364	329	419	384	350	429	397	363
					169	198	226	194	239	280	225	285	338	246	313	363
					25.2	24.8	24.4	26.7	26.1	25.3	27.1	26.5	25.8	27.3	26.8	26.1
85	40	3 2	1 4	TC SHC kW	332	297	266	—	335	303	—	354	321	—	—	332
					158	187	213	—	227	268	—	260	316	—	—	332
					30.6	29.6	28.6	—	31.1	30.1	—	31.6	30.7	—	—	31.0
85	55	5 5	2 4	TC SHC kW	338	303	271	376	342	310	396	362	330	407	376	340
					161	190	216	185	230	270	218	278	329	240	306	340
					29.4	28.4	27.6	30.6	29.8	28.8	31.1	30.3	29.4	31.4	30.6	29.7
85	74	9 1	4 0	TC SHC kW	345	309	276	382	350	316	405	370	337	416	382	349
					163	192	218	187	233	274	220	280	332	242	308	349
					27.8	27.2	26.6	29.4	28.5	27.6	29.8	29.1	28.2	30.1	29.4	28.5
95	75	9 3	4 1	TC SHC kW	332	297	266	—	335	303	—	354	321	—	—	332
					158	187	213	—	227	268	—	260	316	—	—	332
					30 6	29 6	28 6	—	31 1	30 1	—	31 6	30 7	—	—	31 0

LEGEND

BF — Bypass Factor
 Cfm — Cubic Feet Per Minute
 EWT — Condenser Entering Water Temperature
 Ft — Feet
 GPM — Condenser Gallons Per Minute
 kW — Compressor Motor Power Input (Kilowatts)
 Psi — Pounds Per Square Inch
 SHC — Sensible Heat Capacity (1000 Btuh)
 TC — Gross Total Capacity (1000 Btuh)

Performance data (cont)

GROSS COOLING CAPACITIES — WATER-COOLED UNIT

5		50BJ044														
EWT	GPM	PRESSURE DROP			Evap Air — Cfm/BF											
					8000/ .04			12,000/ .06			16,000/ .09			20,000/ .11		
		Evap Air — Ewb Temp — (F)														
		72	67		62	72	67	62	72	67	62	72	67	62		
65	60	35	15	TC SHC kW	513 244 33.2	470 289 31.8	—	557 277 34.6	513 343 33.2	472 407 31.9	581 306 35.4	538 391 34.0	498 467 32.7	595 333 35.8	552 434 34.5	520 514 33.4
	120	110	48	TC SHC kW	527 250 30.2	481 295 29.2	—	575 284 31.1	529 350 30.2	485 413 29.3	601 313 31.6	556 398 30.8	514 476 29.9	618 341 32.0	572 442 31.1	536 525 30.4
	160	180	78	TC SHC kW	530 251 29.4	484 296 28.5	—	579 286 30.2	532 351 29.4	488 415 28.6	607 316 30.7	559 400 29.9	517 477 29.1	624 343 31.0	576 444 30.2	539 527 29.5
75	60	35	15	TC SHC kW	495 236 35.7	453 281 34.1	—	537 269 37.3	494 335 35.6	454 397 34.2	559 298 38.1	516 382 36.5	480 457 35.1	574 325 38.6	532 426 37.1	501 500 35.9
	120	110	48	TC SHC kW	509 242 32.8	464 287 31.7	—	555 276 34.0	509 341 32.8	467 404 31.7	579 306 34.6	534 389 33.5	494 465 32.5	594 332 34.9	550 433 33.9	516 511 33.0
	160	180	78	TC SHC kW	512 243 32.1	467 288 31.0	—	559 278 33.1	513 343 32.1	470 405 31.1	584 307 33.6	538 391 32.6	498 467 31.7	600 334 34.0	555 435 33.0	520 514 32.2
85	60	35	15	TC SHC kW	476 228 38.1	436 273 36.4	397 316 34.7	515 261 39.8	474 326 38.0	436 388 36.4	537 291 40.7	495 374 39.0	460 445 37.4	550 317 41.2	509 416 39.5	482 482 38.3
	120	110	48	TC SHC kW	490 234 35.5	447 278 34.2	—	533 268 36.8	488 333 35.4	448 394 34.2	556 297 37.5	512 380 36.2	474 454 35.0	572 325 37.9	527 423 36.6	496 495 35.6
	160	180	78	TC SHC kW	493 235 34.8	450 280 33.5	—	537 269 36.0	492 334 34.7	451 396 33.6	561 299 36.6	516 382 35.4	478 455 34.4	576 326 37.0	531 425 35.8	499 498 34.9
95	60	35	15	TC SHC kW	457 220 40.5	417 264 38.5	379 307 36.7	494 253 42.3	453 317 40.3	416 378 38.5	513 282 43.2	473 364 41.3	440 432 39.7	526 309 43.8	485 406 41.9	462 462 40.8
	120	110	48	TC SHC kW	470 226 38.1	428 270 36.6	389 312 35.0	510 259 39.5	467 324 38.0	428 384 36.6	532 288 40.3	489 371 38.7	454 441 37.5	545 315 40.7	503 414 39.3	476 476 38.3
	160	180	78	TC SHC kW	473 227 37.5	431 271 36.0	391 313 34.6	514 261 38.8	471 325 37.4	431 386 36.0	536 290 39.4	493 373 38.1	457 443 36.9	550 317 39.9	507 415 38.5	479 479 37.6

6		50BJ054														
EWT	GPM	PRESSURE DROP			Evap Air — Cfm/BF											
					10,000/ .02			15,000/ .04			20,000/ .05			25,000/ .07		
		Evap Air — Ewb Temp — (F)														
		72	67		62	72	67	62	72	67	62	72	67	62		
65	80	34	15	TC SHC Kw	637 303 37.5	583 361 35.8	534 418 34.4	688 346 39.0	636 432 37.5	587 512 36.0	716 385 39.8	664 495 38.3	621 595 37.0	731 421 40.2	682 554 38.8	649 649 37.8
	150	100	43	TC SHC kW	649 309 34.5	594 367 33.4	543 423 32.2	705 353 35.6	650 438 34.5	599 520 33.5	736 392 36.2	680 502 35.1	635 603 34.2	755 429 36.6	699 561 35.4	663 661 34.7
	200	160	69	TC SHC kW	653 310 33.6	597 368 32.6	—	711 355 34.6	654 440 33.6	602 522 32.7	741 394 35.2	685 504 34.1	638 604 33.3	760 431 35.5	705 563 34.5	667 665 33.8
75	80	34	15	TC SHC kW	614 294 40.4	563 352 38.7	515 408 37.1	664 337 42.1	612 422 40.3	565 503 38.8	689 376 42.9	640 486 41.3	598 581 39.8	706 412 43.5	657 543 41.9	628 628 40.9
	150	100	43	TC SHC kW	628 300 37.7	574 357 36.3	524 413 35.0	681 343 38.9	627 428 37.6	577 510 36.4	708 382 39.5	656 492 38.3	612 590 37.3	726 419 39.9	674 550 38.7	641 641 38.0
	200	160	69	TC SHC kW	632 301 36.8	577 359 35.6	—	686 345 37.9	631 430 36.8	581 511 35.7	714 385 38.5	660 494 37.4	615 592 36.4	733 521 38.9	679 552 37.8	645 645 37.1
85	80	34	15	TC SHC kW	592 284 43.4	542 342 41.5	495 398 39.7	639 328 45.2	588 412 43.3	543 492 41.5	663 367 46.1	613 475 44.3	575 566 42.7	677 403 46.7	631 532 44.9	606 606 44.0
	150	100	43	TC SHC kW	605 290 40.8	553 347 39.3	504 402 37.8	655 334 42.2	602 418 40.7	555 498 39.3	682 373 43.0	629 481 41.5	588 575 40.3	697 409 43.4	647 539 42.0	618 618 41.2
	200	160	69	TC SHC kW	609 291 40.0	556 349 38.6	511 406 35.8	660 335 41.3	606 419 39.9	558 500 38.6	687 375 42.0	633 483 40.6	592 577 39.5	703 411 42.4	652 541 41.1	622 622 40.3
95	80	34	15	TC SHC kW	568 274 46.3	519 332 44.2	473 387 42.2	612 318 48.3	562 401 46.1	519 480 44.2	634 356 49.2	587 464 47.2	551 549 45.6	648 393 49.8	601 520 47.8	581 581 46.9
	150	100	43	TC SHC kW	581 280 44.0	530 337 42.2	482 392 40.5	628 323 45.5	576 407 43.8	531 482 42.2	653 363 46.3	601 470 44.6	564 559 43.4	668 399 46.8	619 527 45.2	595 595 44.4
	200	160	69	TC SHC kW	584 281 43.2	533 338 41.6	489 395 38.7	632 325 44.6	580 408 43.0	534 488 41.6	657 364 45.4	605 472 43.8	567 561 42.6	673 401 45.8	623 529 44.3	598 598 43.6

GROSS COOLING CAPACITIES — WATER-COOLED UNIT

7	50BJ064															
EWT	GPM	PRESSURE DROP			Evap Air — Cfm/BF											
		Ft	Psi		16,000/.04			20,000/.05			22,000/.06			24,000/.07		
					Evap Air — Ewb Temp (F)											
					72	67	62	72	67	62	72	67	62	72	67	62
65	90	3 4	1 5	TC SHC kW	816 401 50.6	752 492 48.1	692 581 45.8	846 423 51.7	782 544 49.2	725 650 47.1	856 443 52.1	793 569 49.6	737 681 47.5	866 463 52.5	804 594 50.1	749 711 48.0
	180	10 8	4 7	TC SHC kW	843 412 46.0	775 503 44.1	711 591 42.3	877 444 46.9	809 556 45.0	746 662 43.3	888 459 47.1	821 571 45.3	760 694 43.6	899 474 47.4	832 605 45.7	774 725 44.0
	240	18 0	7 8	TC SHC kW	850 415 44.8	781 505 43.0	716 593 41.4	884 447 45.6	815 558 43.9	751 664 42.3	896 463 45.9	827 583 44.2	765 696 42.6	908 478 46.2	839 608 44.5	779 728 43.0
75	90	3 4	1 5	TC SHC kW	785 389 54.5	722 479 51.7	664 567 49.3	813 421 55.6	750 531 52.9	695 636 50.6	823 436 56.0	761 556 53.3	708 665 51.1	832 451 56.5	771 580 53.8	720 694 51.6
	180	10 8	4 7	TC SHC kW	811 399 50.0	745 489 47.9	683 576 45.9	843 432 51.0	776 542 48.9	716 646 47.0	854 447 51.3	787 567 49.2	729 677 47.4	864 462 51.7	798 591 49.6	742 708 47.8
	240	18 0	7 8	TC SHC kW	818 402 48.8	750 492 46.9	687 579 45.0	850 434 49.7	782 544 47.8	721 649 46.0	861 450 50.0	794 569 48.1	735 680 46.4	872 465 50.4	804 594 48.4	748 711 46.8
85	90	3 4	1 5	TC SHC kW	751 375 58.2	691 466 55.4	636 553 52.8	779 408 59.6	718 517 56.6	665 620 54.2	788 423 60.0	727 541 57.0	677 648 54.7	796 437 60.4	736 565 57.5	689 675 55.3
	180	10 8	4 7	TC SHC kW	777 386 54.1	713 476 51.8	653 562 49.6	806 418 55.1	742 528 52.8	685 631 50.8	817 434 55.4	752 553 53.1	698 660 51.2	827 449 55.8	762 577 53.5	711 689 51.7
	240	18 0	7 8	TC SHC kW	784 388 53.0	718 478 50.8	658 564 48.7	813 421 53.9	747 530 51.7	690 633 49.8	824 436 54.2	758 555 52.0	703 663 50.2	834 451 54.6	768 579 52.4	716 692 50.7
95	90	3 4	1 5	TC SHC kW	719 363 62.2	659 453 59.0	606 538 56.3	743 395 63.4	684 504 60.3	635 603 57.7	751 410 63.8	693 528 60.7	647 629 58.3	759 425 64.3	701 552 61.2	659 654 59.0
	180	10 8	4 7	TC SHC kW	742 372 58.2	680 461 55.6	623 547 53.3	769 405 59.2	707 513 56.7	653 614 54.5	779 420 59.6	717 538 57.1	666 642 55.0	788 435 60.0	726 562 57.5	678 669 55.5
	240	18 0	7 8	TC SHC kW	748 375 57.1	685 463 54.7	627 549 52.5	775 407 58.1	712 515 55.7	658 616 53.7	785 422 58.4	722 540 56.0	671 644 54.1	794 437 58.8	731 564 56.4	683 672 54.6

LEGEND

BF — Bypass Factor
Cfm — Cubic Feet Per Minute
EWT — Condenser Entering Water Temperature
Ft — Feet
GPM — Condenser Gallons Per Minute
kW — Compressor Motor Power Input (Kilowatts)
Psi — Pounds Per Square Inch
SHC — Sensible Heat Capacity (1000 Btuh)
TC — Gross Total Capacity (1000 Btuh)

PRESSURE DROPS FOR 50BJ044-064 UNITS WITH MECHANICALLY CLEANABLE CONDENSER (SHELL-IN-TUBE TYPE)

UNIT 50BJ	GPM	PRESSURE DROP	
		Ft	Psi
044	60	4 4	1 9
	120	16 2	7 0
	160	28 4	12 3
054	80	3 7	1 6
	150	12 4	5 4
	200	21 7	9 4
064	90	2 2	0 95
	180	8 6	3 7
	240	15 0	6 5

Performance data (cont)

GROSS COOLING CAPACITIES — AIR-COOLED UNIT

8 50BK016/09DE016													
Cond Ent Air Temp (F)		Evap Air — Cfm/BF											
		3000/.10			4500/.15			6000/.19			7500/.22		
		Evap Air — Ewb Temp — (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
85	TC	181	166	151	198	182	166	207	190	176	212	196	184
	SHC	87	103	119	99	122	145	109	139	167	119	155	184
	kW	15.1	14.5	13.8	15.8	15.1	14.5	16.1	15.5	14.9	16.3	15.7	15.2
	SCT	116	114	112	118	116	114	119	117	115	120	118	116
95	TC	173	158	144	188	173	158	196	181	167	201	186	176
	SHC	83	100	115	95	119	141	106	135	163	115	151	176
	kW	16.4	15.6	14.9	17.1	16.3	15.6	17.4	16.7	16.1	17.7	17.0	16.5
	SCT	126	124	122	128	126	124	129	127	125	130	128	126
105	TC	165	151	138	178	164	150	186	171	159	190	176	168
	SHC	80	96	112	92	115	137	102	131	157	111	147	168
	kW	17.6	16.7	15.9	18.3	17.5	16.7	18.7	17.9	17.2	19.0	18.2	17.7
	SCT	136	134	132	138	136	134	139	137	135	140	138	137
115	TC	157	143	131	169	155	142	175	161	151	179	166	160
	SHC	76	93	108	88	111	133	98	128	151	107	143	160
	kW	19.0	17.8	16.9	19.5	18.6	17.7	20.0	19.0	18.3	20.2	19.3	18.9
	SCT	146	144	142	148	146	144	149	147	145	149	147	147
9 50BK024/09DD024													
Cond Ent Air Temp (F)		Evap Air — Cfm/BF											
		4000/.12			6000/.15			8000/.18			10,000/.21		
		Evap Air — Ewb Temp — (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
85	TC	227	208	190	250	230	211	262	242	222	270	248	228
	SHC	115	129	149	124	155	183	137	175	214	149	195	228
	kW	18.8	18.0	17.2	19.1	18.5	17.6	19.8	18.8	18.0	19.8	19.0	18.3
	SCT	112	110	108	115	113	111	116	114	112	117	115	113
95	TC	218	200	182	240	220	202	250	230	212	257	237	218
	SHC	104	125	145	119	150	179	133	170	207	146	191	218
	kW	20.5	19.5	18.6	21.0	20.0	19.2	21.5	20.5	19.6	21.8	21.3	20.9
	SCT	121	119	117	125	122	120	126	124	122	126	124	122
105	TC	209	190	176	229	210	192	239	220	201	245	226	207
	SHC	101	121	143	116	145	173	129	166	200	142	187	207
	kW	22.2	21.4	20.1	22.8	21.8	20.6	23.3	22.2	21.2	23.7	22.6	21.5
	SCT	131	129	127	134	132	130	135	133	131	136	134	132
115	TC	199	181	166	218	200	182	227	209	191	232	215	200
	SHC	97	117	137	111	141	169	124	162	191	137	182	200
	kW	23.9	22.9	21.6	24.6	23.4	22.1	25.2	24.0	22.7	25.5	24.3	23.0
	SCT	141	139	137	144	142	139	145	143	141	145	143	141
10 50BK028/09DD028													
Cond Ent Air Temp (F)		Evap Air — Cfm/BF											
		5000/.12			7500/.15			10,000/.18			12,500/.21		
		Evap Air — Ewb Temp — (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
85	TC	280	255	232	318	291	266	332	306	281	342	315	290
	SHC	134	159	184	158	196	234	175	224	272	191	250	290
	kW	24.5	23.3	22.5	25.7	24.5	23.4	26.4	25.2	24.1	26.7	25.6	24.4
	SCT	112	110	108	115	113	111	116	114	112	117	115	113
95	TC	268	243	224	303	277	244	316	291	267	325	299	275
	SHC	129	153	180	152	191	228	169	218	264	185	244	275
	kW	26.5	24.9	23.9	27.8	26.4	25.2	28.5	27.1	25.9	28.9	27.6	26.3
	SCT	122	119	117	125	122	120	126	124	121	127	124	122
105	TC	256	233	214	287	264	241	300	275	243	307	283	260
	SHC	123	149	174	146	185	222	163	212	242	178	237	260
	kW	28.3	26.9	25.3	29.8	28.4	26.9	30.5	29.1	27.6	31.0	29.5	28.1
	SCT	131	129	126	134	132	130	135	133	130	136	134	131
115	TC	244	220	203	272	249	228	275	260	238	280	267	245
	SHC	119	143	170	141	179	216	151	206	238	166	231	245
	kW	30.5	29.0	27.4	31.8	30.1	28.6	32.3	30.8	29.3	32.5	31.3	29.8
	SCT	141	139	137	143	141	139	144	142	140	144	143	141

GROSS COOLING CAPACITIES — AIR-COOLED UNIT

11		50BK034/09DD034											
Cond Ent Air Temp (F)		Evap Air — Cfm/BF											
		6000/.12			9000/ 15			12,000/.18			15,000/ 21		
		Evap Air — Ewb Temp — (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
85	TC	342	315	284	386	355	325	405	374	343	416	385	355
	SHC	163	195	224	190	235	281	208	267	322	228	298	355
	kW	30.2	28.7	27.7	31.5	30.1	28.7	32.3	30.9	29.5	32.7	31.3	30.1
	SCT	112	109	107	114	112	110	115	113	111	116	114	112
95	TC	328	300	271	369	338	309	386	358	326	396	365	337
	SHC	157	188	217	183	229	272	204	261	316	222	289	337
	kW	32.5	30.8	29.5	34.0	32.4	30.9	34.7	33.2	31.7	35.2	33.7	32.3
	SCT	121	119	117	123	121	119	124	122	120	125	123	121
105	TC	314	285	258	350	321	288	366	332	302	375	346	318
	SHC	151	181	211	177	221	266	196	253	301	216	282	318
	kW	34.8	32.9	31.4	36.3	34.5	33.0	37.2	35.5	33.7	37.6	36.0	34.3
	SCT	130	128	126	133	131	128	134	131	129	134	132	130
115	TC	298	270	245	331	298	272	346	318	275	353	325	293
	SHC	144	174	204	170	214	259	188	245	275	208	277	293
	kW	37.1	35.0	33.1	38.6	36.8	34.9	39.4	37.6	35.8	40.0	38.2	36.3
	SCT	140	137	135	142	140	138	143	141	138	144	142	139

12		50BK044/09DE044											
Cond Ent Air Temp (F)		Evap Air — Cfm/BF											
		8000/0.04			12,000/0.06			16,000/0.09			20,000/0.11		
		Evap Air — Ewb Temp — (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
85	TC	486	445	406	530	485	446	551	509	472	567	522	492
	SHC	232	277	321	267	332	394	296	380	453	324	423	493
	kW	37.1	35.4	33.9	38.8	37.1	35.5	39.6	38.0	36.5	40.2	38.5	37.3
	SCT	114	112	110	117	114	112	118	116	114	119	116	115
95	TC	466	424	387	504	462	424	524	484	449	538	496	471
	SHC	224	268	311	258	322	383	286	369	439	314	412	471
	kW	39.7	37.8	36.0	41.5	39.6	37.8	42.3	40.5	39.0	43.0	41.1	40.0
	SCT	124	121	119	126	123	121	127	125	123	128	125	124
100	TC	454	415	377	490	451	414	509	470	437	522	484	459
	SHC	219	263	306	253	318	378	281	364	431	308	407	459
	kW	41.0	39.0	37.1	42.8	40.8	39.0	43.7	41.7	40.1	44.3	42.4	41.3
	SCT	128	126	124	130	128	126	131	129	127	132	130	128
105	TC	443	403	367	476	438	402	496	455	426	506	468	449
	SHC	214	258	301	247	312	372	276	358	424	303	400	449
	kW	42.3	40.2	38.1	44.0	42.0	40.0	45.0	43.0	41.4	45.6	43.6	42.6
	SCT	133	130	128	134	132	130	136	133	132	136	134	133
115	TC	418	381	347	449	412	379	467	428	404	476	440	426
	SHC	204	248	291	237	302	360	266	349	403	293	388	426
	kW	44.6	42.4	40.1	46.5	44.2	42.2	47.5	45.3	43.7	48.2	46.0	45.1
	SCT	142	139	137	143	141	139	144	142	141	145	143	142

13		50BK054/09DE054											
Cond Ent Air Temp (F)		Evap Air — Cfm/BF											
		10,000/0.02			15,000/0.04			20,000/0.05			25,000/0.07		
		Evap Air — Ewb Temp — (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
85	TC	590	540	493	638	586	541	663	612	573	678	630	602
	SHC	284	342	397	327	411	492	366	474	565	403	532	602
	kW	43.0	41.1	39.2	44.8	42.9	41.2	45.8	43.9	42.4	46.3	44.5	43.5
	SCT	114	112	110	116	114	112	117	115	113	118	116	115
95	TC	565	515	470	607	558	516	631	582	547	645	598	576
	SHC	274	330	386	316	400	478	355	462	545	392	518	576
	kW	46.1	43.9	41.8	47.9	45.8	43.9	49.0	46.8	45.3	49.6	47.5	46.6
	SCT	123	121	119	125	123	121	126	124	122	127	125	124
100	TC	551	504	459	593	545	503	616	567	535	629	581	564
	SHC	268	325	380	311	394	472	350	456	534	386	511	564
	kW	47.5	45.3	43.1	49.6	47.3	45.3	50.6	48.3	46.8	51.2	49.0	48.2
	SCT	128	125	123	130	127	126	131	128	127	131	129	128
105	TC	538	491	448	576	529	489	597	552	521	610	566	551
	SHC	263	319	375	305	388	464	343	450	521	380	505	551
	kW	49.1	46.7	44.4	51.0	48.6	46.6	52.0	49.8	48.2	52.7	50.5	49.8
	SCT	132	130	128	134	132	130	135	133	131	136	134	133
115	TC	509	464	423	543	501	462	562	520	496	574	533	523
	SHC	252	308	362	294	376	449	331	436	496	368	489	523
	kW	52.0	49.3	46.8	53.9	51.4	49.2	55.0	52.5	51.2	55.7	53.4	52.7
	SCT	141	139	137	143	141	139	144	142	141	144	142	142

LEGEND

BF	— Bypass Factor	SCT	— Saturated Condensing Temperature (F)
Ewb	— Entering Wet-Bulb	SHC	— Sensible Heat Capacity (1000 Btu/h)
kW	— Compressor Motor Power Input (Kilowatts)	TC	— Total Capacity (1000 Btu/h)

Performance data (cont)

GROSS COOLING CAPACITIES — AIR-COOLED UNIT

14		50BK064/09DE064											
Cond Ent Air Temp (F)		Evap Air — Cfm/BF											
		16,000/0.04			20,000/0.05			22,000/0.06			24,000/0.07		
		Evap Air — Ewb Temp — (F)											
		72	67	62	72	67	62	72	67	62	72	67	62
85	TC	759	696	639	785	723	669	797	733	681	806	743	694
	SHC	378	468	554	410	520	621	426	544	651	441	569	679
	kW	56.8	54.0	51.5	57.9	55.2	52.8	58.4	55.7	53.4	58.8	56.1	54.0
	SCT	117	114	112	118	115	113	118	116	113	119	116	114
95	TC	722	661	606	745	686	635	756	695	647	765	704	660
	SHC	364	453	538	396	504	604	411	529	631	427	553	655
	kW	60.8	57.8	55.0	62.0	59.0	56.5	62.5	59.5	57.1	62.9	59.9	57.7
	SCT	125	123	121	126	124	122	127	124	122	127	125	123
100	TC	701	642	591	724	666	617	734	674	629	742	683	642
	SHC	357	445	531	388	496	593	403	520	619	419	544	641
	kW	62.8	59.7	56.9	64.1	60.9	58.3	64.5	61.5	59.0	65.0	61.8	59.6
	SCT	130	127	125	131	128	126	131	129	127	131	129	127
105	TC	684	626	574	705	648	601	715	657	614	719	665	624
	SHC	350	438	522	382	489	584	397	513	609	411	537	624
	kW	64.9	61.6	58.6	66.2	62.9	60.2	66.6	63.4	61.0	67.0	63.8	61.6
	SCT	134	132	130	135	133	131	136	133	131	136	134	132
115	TC	641	588	541	663	609	567	669	616	580	675	622	592
	SHC	334	423	504	367	473	562	381	496	580	396	519	592
	kW	68.8	65.3	62.1	70.0	66.6	63.9	70.6	67.0	64.7	70.9	67.5	65.6
	SCT	143	141	139	144	142	140	144	142	140	144	142	141

LEGEND

BF — Bypass Factor
Ewb — Entering Wet-Bulb
kW — Compressor Motor Power Input (Kilowatts)

SCT — Saturated Condensing Temperature (F)
SHC — Sensible Heat Capacity (1000 Btuh)
TC — Total Capacity (1000 Btuh)

Head pressure control

One of the most common ways of controlling head pressure in air conditioning units with water-cooled condensers is with a field-supplied water regulating valve.

The valve is designed to open when it senses a rise in head pressure. The resulting increase in water flow through the condenser carries away excess heat and head pressure drops. Refer to 50BJ, BK Installation Instructions for further information.

HEATING COIL RATINGS*

UNIT 50BJ, BK	AIR CFM	1-ROW NF STEAM†		2-ROW HOT WATER‡			
		TC	LAT	TC	LAT	Gpm	PD
016	4,500	186	98	361	134	36	1.9
	6,000	217	94	428	126	43	2.5
	7,500	248	91	490	121	49	3.4
024	6,000	209	92	410	126	41	2.4
	8,000	246	88	500	118	50	3.5
	10,000	272	85	580	114	58	3.9

Values in *italics* also apply to 2-row NF steam.

LAT — Leaving Air Temperature (F)

PD — Pressure Drop (ft of water)

TC — Total Capacity (1000 Btuh)

*Refer to 39 Series Coils and Heat Exchangers literature for 40-60 ton units.

†NF — Nonfreeze coil ratings based on 2 psig steam, 60 F entering air.

‡2-row hot water coil ratings based on 200 F entering water temperature, 20 F water temperature drop, 60 F entering air.

ACCESSORY GRILLE STATIC PRESSURE LOSSES (in. wg)

MODEL 50BJ, BK	AIR QTY (Cfm)	ACCY INLET GRILLE
016	3,000	.01
	4,500	.02
	6,000	.03
	7,500	.05
024	4,000	.02
	6,000	.03
	8,000	.06
	10,000	.08

HEATING CAPACITY FACTORS

STEAM COIL						
Steam Pressure (Psig)	Entering Air Temperature (F)					
	40	50	60	70	80	
0	1.11	1.03	.96	.89	.82	
2	1.14	1.07	1.00	.93	.86	
5	1.19	1.11	1.05	.98	.91	
10	1.25	1.18	1.11	1.04	.97	
HOT WATER COIL						
Water Temp (F) Drop	Entering Water Temp (F)	Entering Air Temperature (F)				
		40	50	60	70	80
10	180	1.15	1.06	.96	.87	.77
	200	1.35	1.25	1.16	1.07	.97
	220	1.54	1.44	1.35	1.26	1.17
20	180	.98	.88	.79	.70	.60
	200	1.18	1.09	1.00	.90	.81
	220	1.37	1.28	1.20	1.11	1.01
30	180	.79	.70	.61	.52	.42
	200	1.00	.91	.85	.73	.64
	220	1.22	1.12	1.03	.94	.85

NOTES (for Heating Coil Rating table):

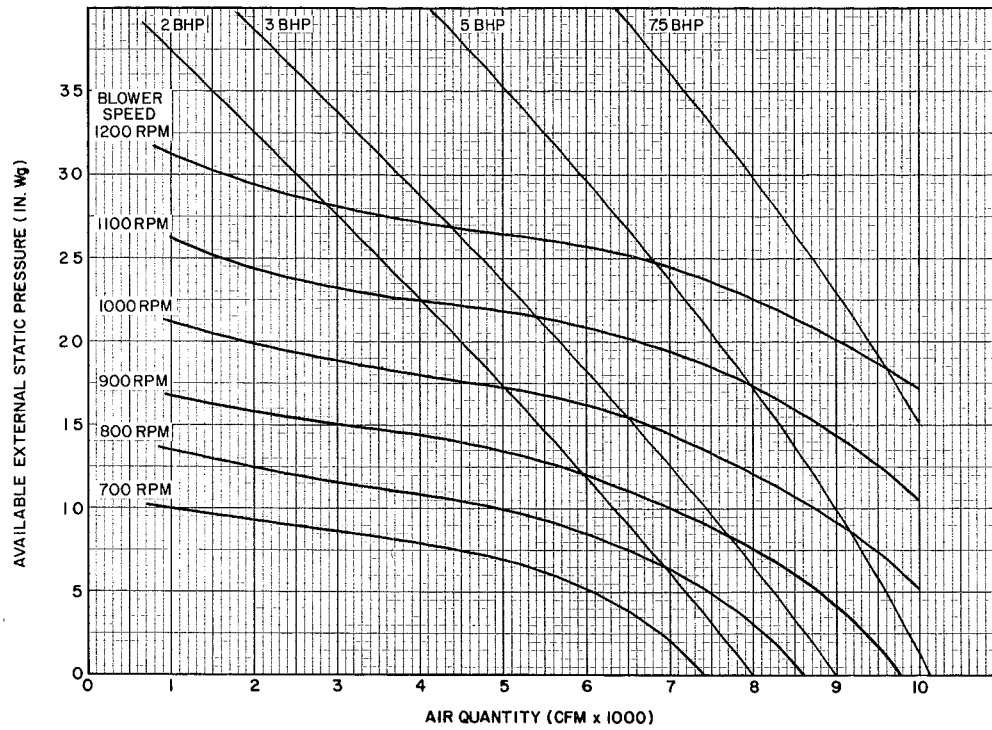
1. Maximum allowable leaving air temperature 140 F.
2. Maximum operating limit for heating coils is 200 psig or 400 F.
3. To obtain capacities other than those given above, multiply the Btuh value from the Heating Coil Ratings table by the proper value from the Heating Capacity Factors table.
4. Formulas:

$$\text{Final temp (F)} = \text{ent db (F)} + \frac{\text{Btuh}}{1.1} \times \text{cfm}$$

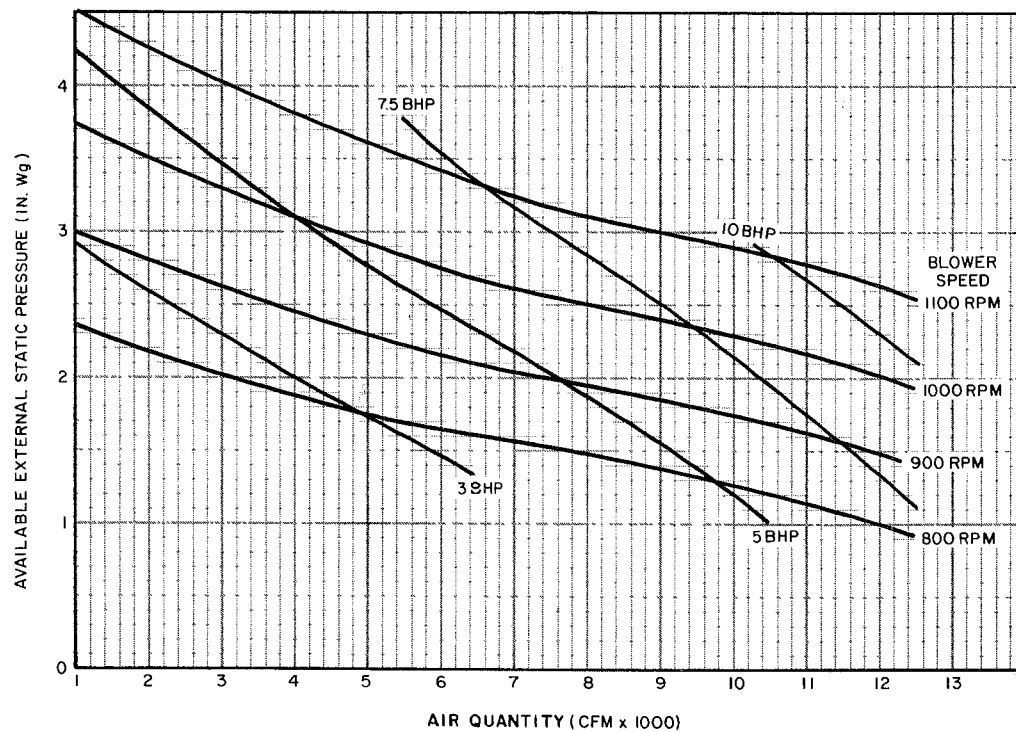
$$\text{Gpm} = \frac{\text{Btuh}}{500 \times \text{water temp drop (F)}}$$

5. Reduced airflow (dirty filters, loose or broken fan belt, etc.) over coil during cooling cycle may result in freeze-up of nearby heating coil. Since units normally require a low-pressure switch cutout setting at about 5 F, use of a freeze-up thermostat is recommended if heating coil is not drained or filled with an antifreeze solution.
6. Field-supplied thermostat and control valve are required when using accessory heating coils.

FAN PERFORMANCE — 50BJ,BK016,024



FAN PERFORMANCE — 50BJ,BK028

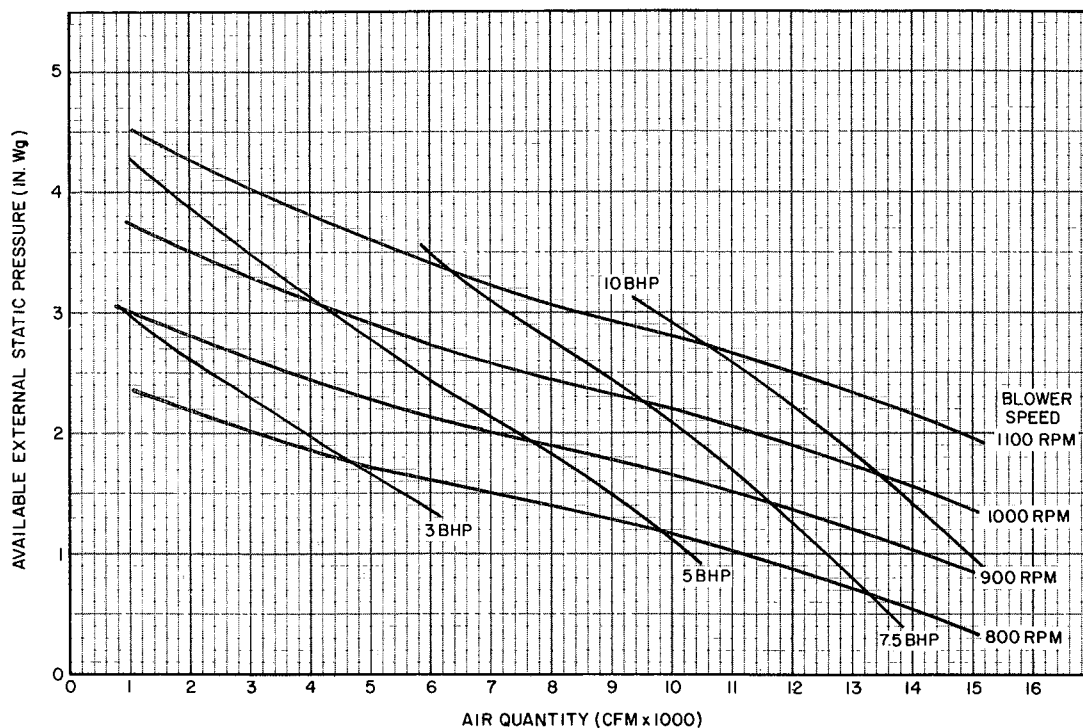


NOTE: Fan performance is based on wet coil, clean filters and deducted casing losses. Refer to Physical Data Table for average efficiencies.

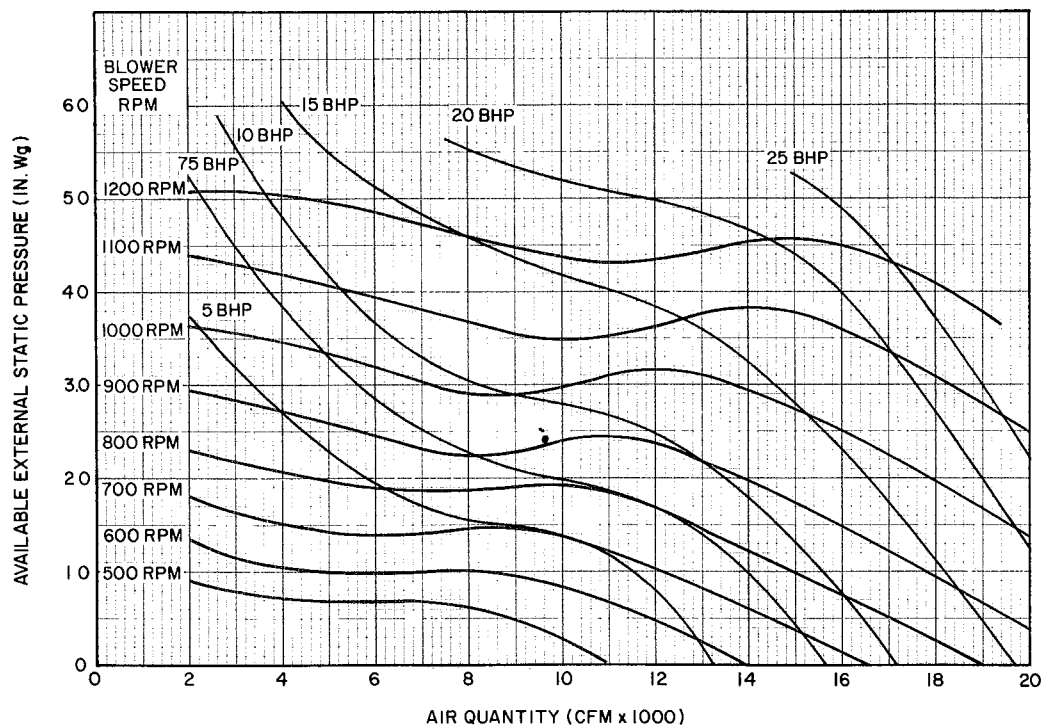
$$kW = \frac{Bhp \times 746}{\text{Efficiency}}$$

Performance data (cont)

FAN PERFORMANCE — 50BJ,BK034



FAN PERFORMANCE — 50BJ,BK044



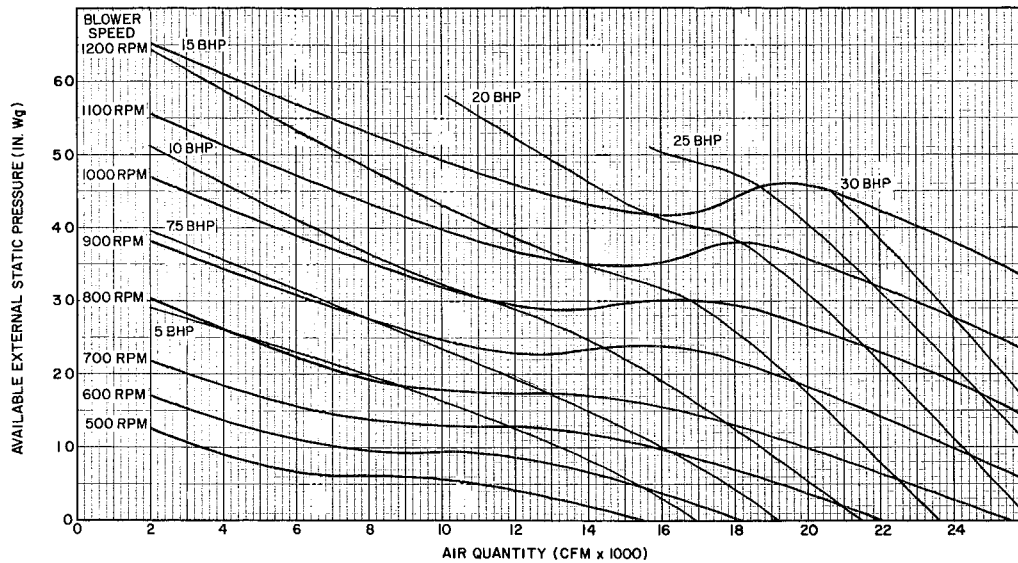
NOTES:

- 1 Fan performance is based on wet coil, clean filters and deducted casing losses. Refer to Physical Data Table for average efficiencies

$$kW = \frac{Bhp \times 746}{\text{Efficiency}}$$

- 2 For 50BJ,BK044-064 units with inlet guide vane option, see correction factors table, page 17

FAN PERFORMANCE — 50BJ,BK054,064



NOTES

- Fan performance is based on wet coil, clean filters and deducted casing losses. Refer to Physical Data Table for average efficiencies.

$$kW = \frac{Bhp \times 746}{\text{Efficiency}}$$

- For 50BJ,BK044-064 units with inlet guide vane option, see correction factors table below.

CORRECTION FACTORS FOR UNITS WITH INLET GUIDE VANES EXTERNAL STATIC PRESSURE DROPS (in. wg)

UNIT CFM	50BJ,BK044	50BJ,BK054,064
2,000	0.10	1.00
4,000	0.30	1.00
6,000	0.30	0.90
8,000	0.30	0.75
10,000	0.40	0.60
12,000	0.30	0.30
14,000	0.10	0.25
16,000	0.40	0.30
18,000	0.30	0.20
20,000	0.10	0.40
22,000	—	0.40
24,000	—	0.30

When unit is equipped with inlet guide vanes, correct external static pressure shown on standard fan performance curves by subtracting correction factor shown above.

Example 50BJ044

16,000 — Cfm

1,200 — Blower Speed (Rpm)

4.5 in. wg (from standard fan performance curve)

-0.4 in. wg (correction factor from table for inlet guide vanes)

4.1 in. wg (available external static with inlet guide vanes)

Example: 50BJ054

16,000 — Cfm

1,200 — Blower Speed (Rpm)

4.18 in. wg (from standard fan performance curve)

-0.30 in. wg (correction factor from table for inlet guide vanes)

3.88 in. wg (available external static with inlet guide vanes)

FAN PULLEY SELECTION TABLE (50BJ,BK044-064)

FAN RPM	MOTOR PULLEY DIA. (in.)	FAN PULLEY DIA. (in.)	5V BELT SIZE (2 Req'd) (BELT LENGTH in.)
600	8.0	23.6	90
650	7.1	18.7	80
700	7.5	18.7	80
738	8.0	18.7	85
789	8.5	18.7	90
845	9.0	18.7	85
865	9.25	18.7	85
915	9.75	18.7	85
961	10.3	18.7	85
1,000	8.0	14.0	75
1,028	10.9	18.7	85
1,054	11.3	18.7	90
1,100	11.8	18.7	90
1,166	12.5	18.7	90
1,200	9.0	13.2	71

Shaded values indicate standard or optional pulley combinations available as shown in Physical Data Table. All other combinations are field-supplied.

Electrical data

UNIT	V-PH-HZ	VOLTAGE RANGE		COMP #1		COMP #2		INDOOR FAN MOTOR		POWER SUPPLY	
		Min	Max	RLA	LRA	RLA	LRA	Hp	FLA	MCA*	MOCP†
50BJ016	208/230-3-60	187	254	50 0	191	—	—	3	9.2	71.7	110
	460-3-60	414	508	22.1	86	—	—	3	4.6	32.2	50
	575-3-60	518	632	17.9	69	—	—	3	3.7	26.2	40
50BJ024	208/230-3-60	187	254	36.0	137	36.0	137	5	13.2	94.2	125
	460-3-60	414	508	16.0	62	16.0	62	5	6.6	42.6	50
	575-3-60	518	632	12.9	50	12.9	50	5	5.6	35.1	45
50BJ028	208/230-3-60	187	254	49.3	191	35.7	137	7½	22.0	120.0	150
	460-3-60	414	508	22.2	86	16.0	62	7½	11.0	54.8	70
	575-3-60	518	632	18.0	69	13.0	50	7½	8.7	44.2	60
50BJ034	208/230-3-60	187	254	49.3	191	49.3	191	7½	22.0	132.9	175
	460-3-60	414	508	22.2	86	22.2	86	7½	11.0	61.0	80
	575-3-60	518	632	18.0	69	18.0	69	7½	8.7	49.2	60
50BJ044	208/230-3-60	187	254	57.9	283	57.9	283	15	46.2	176.5	225
	460-3-60	414	508	26.5	142	26.5	142	15	21.0	80.6	100
	575-3-60	518	632	22.2	98	22.2	98	15	15.4	65.4	80
50BJ044 Alt Motor	208/230-3-60	187	254	57.9	283	57.9	283	20	59.4	189.7	225
	460-3-60	414	508	26.5	142	26.5	142	20	27.0	86.6	110
	575-3-60	518	632	22.2	98	22.2	98	20	20.0	70.0	90
50BJ054	208/230-3-60	187	254	80.8	446	60.0	283	20	59.4	220.4	300
	460-3-60	414	508	35.8	223	26.5	142	20	27.0	98.3	125
	575-3-60	518	632	30.0	164	22.2	98	20	20.0	79.7	100
50BJ054 Alt Motor	208/230-3-60	187	254	80.8	446	60.0	283	25	74.8	235.8	300
	460-3-60	414	508	35.8	223	26.5	142	25	34.0	105.3	125
	575-3-60	518	632	30.0	164	22.2	98	25	25.6	85.3	110
50BJ064	208/230-3-60	187	254	91.5	446	91.5	446	25	74.8	280.7	350
	460-3-60	414	508	42.6	253	42.6	253	25	34.0	129.9	150
	575-3-60	518	632	32.2	164	32.2	164	25	25.6	98.1	125
50BJ064 Alt Motor	208/230-3-60	187	254	91.5	446	91.5	446	30	88.0	293.9	350
	460-3-60	414	508	42.6	253	42.6	253	30	40.0	135.9	175
	—	—	—	—	—	—	—	—	—	—	—
50BK044	208/230-3-60	187	254	77.2	345	77.2	345	15	46.2	219.9	250
	460-3-60	414	508	35.8	173	35.8	173	15	21.0	101.6	125
	575-3-60	518	632	30.0	120	30.0	120	15	15.4	82.9	110
50BK044 Alt Motor	208/230-3-60	187	254	77.2	345	77.2	345	20	59.4	233.1	300
	460-3-60	414	508	35.8	173	35.8	173	20	27.0	107.6	125
	575-3-60	518	632	30.0	120	30.0	120	20	20.0	87.5	110
50BK054	208/230-3-60	187	254	101.5	446	77.2	345	20	59.4	263.5	350
	460-3-60	414	508	48.6	223	37.9	173	20	27.0	125.7	150
	575-3-60	518	632	38.6	164	30.0	120	20	20.0	98.3	125
50BK054 Alt Motor	208/230-3-60	187	254	101.5	446	77.2	345	25	74.8	278.9	350
	460-3-60	414	508	48.6	223	37.9	173	25	34.0	132.7	175
	575-3-60	518	632	38.6	164	30.0	120	25	25.6	103.9	125
50BK064	208/230-3-60	187	254	120.0	506	120.0	506	25	74.8	344.8	450
	460-3-60	414	508	56.5	253	56.5	253	25	34.0	161.1	200
	575-3-60	518	632	42.9	176	42.9	176	25	25.6	122.1	150
50BK064 Alt Motor	208/230-3-60	187	254	120.0	506	120.0	506	30	88.0	358.0	450
	460-3-60	414	508	56.5	253	56.5	253	30	40.0	167.1	200
	575-3-60	518	632	42.9	176	42.9	176	—	—	—	—

FLA — Full Load Amps
Hp — Nominal Horsepower
LRA — Locked Rotor Amps
MCA — Minimum Circuit Amps
MOCP — Maximum Overcurrent Protection Device (amps)
RLA — Rated Load Amps

*Minimum circuit amps (MCA) for wire sizing complies with NEC Section 430-24

†In compliance with NEC requirements for multimotor and combination load equipment (Ref NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse only

NOTES:

1 Compressor circuit breakers are current sensitive and temperature compensated to ensure compressor cutoff if current draw becomes excessive. Breakers must be manually reset

- 2 Discharge gas thermal protection or internal protection with automatic reset de-energizes the control circuit if extreme compressor motor temperature should occur from excessive gas temperature or motor overloading
- 3 Low- and high-pressure switches automatically shut off compressor(s) if refrigerant pressure exceeds switch settings. This action protects against loss of charge
- 4 Indoor fan motor circuit breaker protects against motor overload. Breaker requires manual reset
- 5 The 50BJ, BK units are ETL listed at 208/230 and 460 v and C S A certified at 575 v
- 6 Phase imbalance shall not exceed 2%.
- 7 Wire sizing amps are a sum of 125% of the FLA for largest motor plus 100% of FLA for all other motors in the unit
- 8 Maximum instantaneous current flow during starting is the sum of the LRA for last compressor to start plus the FLA for all other compressors in the unit

Controls

Control sequence

All units — The indoor fan circuit breaker (IFCB) must be closed for the control circuit to be energized. When breaker is closed, the SYSTEM light will be energized

The 044-064 units are equipped with a switch labeled STANDBY. When switch is closed, the indoor fan contactor (IFC) is energized and the indoor fan will start and run continuously. A light labeled FAN will also be energized. To use accessory timer control, switch must be put in standby position.

All units are equipped with the Honeywell W7100 discharge air controller. This controller is equipped with 3 control knobs: set point, reset and control band. Purpose of controller is to regulate the leaving air temperature to the set point. A setting below 50 F may decrease unit efficiency due to use of hot gas bypass at light loads. The reset knob is used to adjust reset control range from 5 F to 20 F. Reset feature requires field supplied components and wiring. The control band knob allows controller to be adjusted for the required number of stages. The control band should be set at 6 F for 50BJ, BK016-034, 054, 064 units and 8 F for 50BJ, BK044 units. Increasing control band setting above these recommended settings will decrease compressor cycling and increase leaving air temperature variations. Decreasing setting will NOT reduce discharge air temperature variations but will increase compressor cycling

The controller is also factory equipped with 2 fixed resistors. One resistor is used to correct for the number of steps. This is done by placing a 1/4-watt, 5%-resistor across terminals **7** and **8** on microprocessor. A 3-stage, 300-ohm resistor is used on 016 units. A 4-stage, 400-ohm resistor is used on 044 units and a 600-ohm resistor is used on 024-034, 054 and 064 units. A second 510-ohm resistor is connected between terminals **9** and **Y** to indicate unit does not have an economizer. These units do not have a factory-supplied economizer. If a field supplied economizer is to be added, remove the 510-ohm resistor. Consult Carrier Corporation for more details.

If the discharge air deviates 1 F above or below the control band while unit is running, then a cooling capacity stage will either be added or removed according to the loading sequence table found on this page. Additional capacity stages will either be turned on or off until discharge air temperature is within control band or changing at a rate that will allow it to be within control band within 10 minutes.

The controller also has a fixed guaranteed minimum on and off time of 4 minutes to prevent compressor cycling

These units are additionally equipped with a Time Guard® circuit. This circuit prevents compressor no. 1 from restarting until 4 minutes, 45 seconds have elapsed from last shutdown. Compressor no. 2 will not restart until 6 minutes, 10 seconds have elapsed.

Each compressor is equipped with a high-pressure switch (HPS), discharge gas thermostat (DGT) or internal protection (IP) and low-pressure switch (LPS). If any of these trips, then the compressor will shut down. If after 4 minutes, 45 seconds for compressor no. 1 and 6 minutes, 10 seconds for compressor no. 2, the switch resets, the compressor will restart within 15 seconds for compressor no. 1 or 19 seconds for compressor no. 2

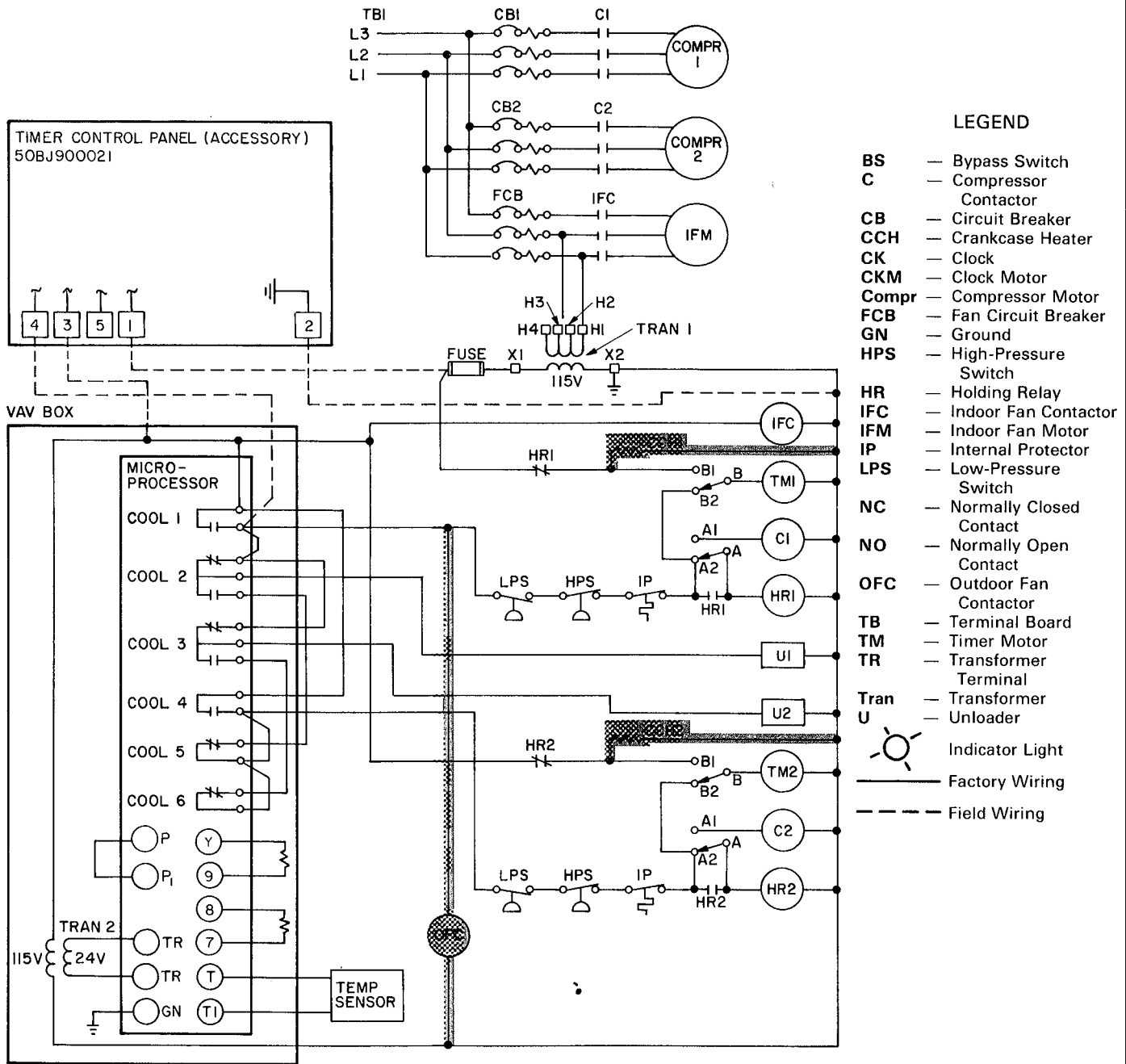
The 50BK condenserless units are equipped with a liquid line solenoid (LLS). When a stage calls for compressor shutdown, the liquid line solenoid will close first. The compressor will continue to run until the low-pressure switch opens.

LOADING SEQUENCE

MODEL 50BJ, BK	STAGE					
	1	2	3	4	5	6
016	33%	67%	100%	—	—	—
024	17%	34%	50%	67%	84%	100%
028	17%	34%	50%	67%	84%	100%
034	17%	34%	50%	67%	84%	100%
044	25%	50%	75%	100%	—	—
054	19%	38%	57%	63%	84%	100%
064	17%	34%	50%	67%	84%	100%

Typical control wiring schematic

50BJ,BK024, 028 AND 034;
208/230, 460, 575-3-60

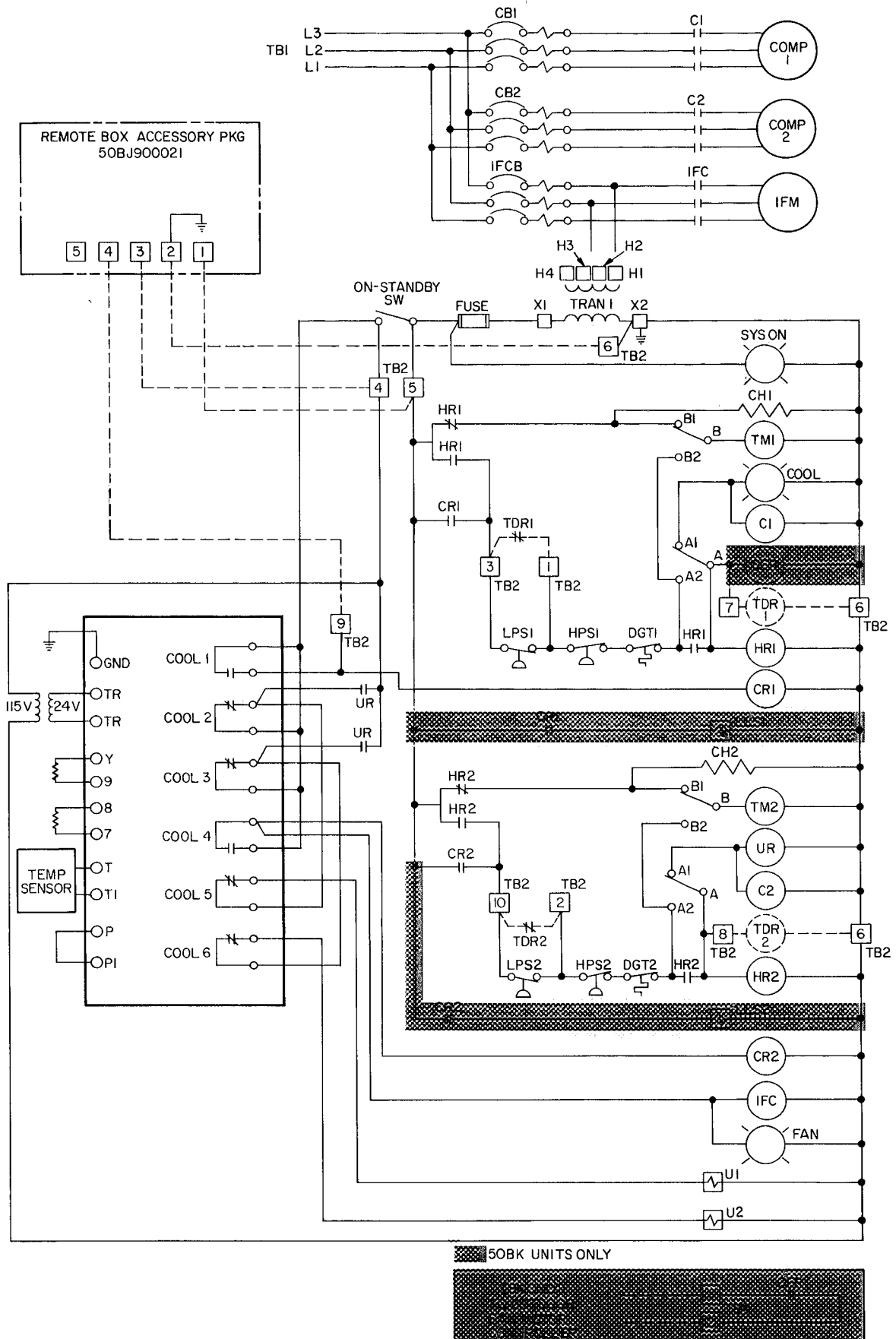


50BK UNIT ONLY

NOTES:

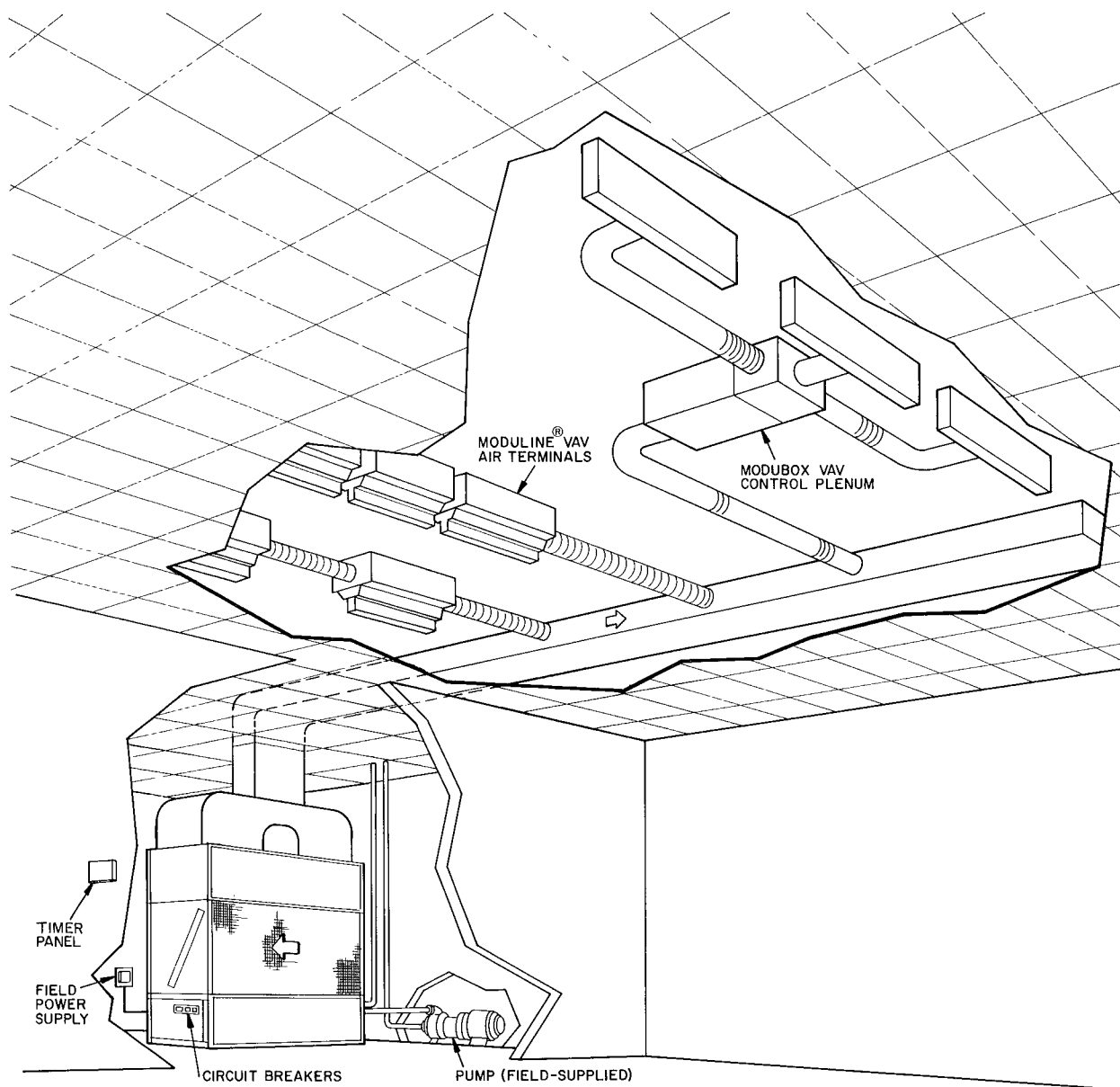
- 1 Wiring diagram is presented for information only; for specific unit diagrams, see 50BJ,BK wiring book.
- 2 All 50BK (condenserless) units and 50BJ044-064 have crankcase heaters.
- 3 At least one time-control panel is required. It may control one or several Modu-Vac units
- 4 All units have a transformer for 115-v control circuit.
- 5 Condenser (outdoor) fan relays are shipped with units 50BK016,024,044-064.
- 6 On all extended voltage (208-230) units, the control transformer is connected for 208/3/60 application. For 230/3/60 design center application, transformer must be reconnected
7. Three-phase motors are protected under primary single-phasing conditions.
- 8 Outdoor fan motor must not exceed 1/2 hp at 125 or 250 volts (016-034 only).

50BJ,BK044, 054 AND 064; 208/230, 460, 575-3-60



Maximum contact rating 125 VA at 120/250VAC; 60-Hz
Minimum switching inrush 6 VA

Typical piping and wiring



NOTES:

- 1 Wiring and piping shown are general points-of-connection guides only and are not intended for or to include all details for specific installation
- 2 All wiring must comply with applicable local and national codes
- 3 All piping must follow standard refrigerant piping techniques. Refer to Carrier System Design Manual, Part 3, for details
- 4 For maximum working pressure, see Physical Data table, page 4

Guide specifications — 50BJ016-034

Indoor Packaged Unit

Variable Volume Application — Water-Cooled

HVAC Guide Specifications — Section 15787

Size Range: **15-30 Tons, Nominal**

Carrier Model Number: **50BJ**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Indoor vertical, water-cooled, microprocessor controlled cooling packaged unit utilizing a reciprocating semi-hermetic compressor(s). Unit shall supply air through ductwork as shown on the contract drawings.

1.02 QUALITY ASSURANCE

- A. Unit shall be designed to conform to ANSI B9.1
- B. Unit shall be ETL listed. Unit shall be CSA certified.
- C. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

1.03 DELIVERY, STORAGE AND HANDLING

- A. To be per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory assembled single piece, vertical, water cooled cooling unit. The unit shall consist of shell and coil condenser, serviceable hermetic compressor(s), fan section complete with centrifugal fan and motor mounting bracket, coil section complete with direct-expansion coil, drain pan and filter track, factory wiring, piping and controls. An operating charge of refrigerant (R-22) shall be furnished.

B. Unit Cabinet:

- 1. Cabinet shall be constructed of zinc surface alloyed steel with a baked enamel decorative finish.
- 2. Cabinet shall be fully insulated with a fire retardant material.

C. Fan Section:

- 1. Double inlet centrifugal fan wheel with forward curved blades shall be designed for continuous operation at maximum fan speed. Fan wheel and scroll shall be constructed of steel with corrosion resistant finish and shall be statically and dynamically balanced.
- 2. Fan shall be belt-driven and drive shall include an adjustable pitch motor pulley (15 and 20 tons) or a fixed pitch motor pulley.
- 3. Bearings shall be sealed, permanently lubricated, ball bearing type.

D. Compressor(s):

- 1. Serviceable hermetic type
- 2. Factory mounted on spring vibration isolators.

E. Condenser:

- 1. The condenser shall be of the shell and coil type.
- 2. Tubes shall be seamless with no internal joints
- 3. Condenser shall have a maximum working pressure of 550 psig (except 20 ton unit) on the water side.

F. Coils:

- 1. Evaporator coil shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.
- 2. Tube sheet openings shall be belled to prevent tube wear.
- 3. Evaporator coil shall be of the full face active design.
- 4. Heating coils optional (Special Features Section).
 - a. 2-row hot water reheat coil
 - b. One-row steam distributing type reheat coil
 - c. 2-row hot water preheat coil
- 5. Direct-expansion coils shall be designed and tested in accordance with ANSI/ASHRAE 15 Safety Code for mechanical refrigeration.
- 6. Hydronic heat in coils shall be factory tested for leakage at 350 psig air pressure with the coil submerged in water. After testing the coil shall be dehydrated and charged with dry air.
- 7. A filter frame designed to accept standard 2-in. cleanable or disposable filters shall be installed upstream of the cooling coil. Disposable filters shall be supplied with the unit.

G. Operating Characteristics:

- 1. Unit shall be capable of providing a variable volume of air at a specified external static pressure within the units normal operating range
- 2. Unit shall have multi-stage cooling capacity control.

H. Controls and Safeties:

1. Unit Controls.

- a. A unit mounted system selector switch shall be provided for on-off operation.
- b. Unit shall have a factory-installed and wired discharge air control system based on a microprocessor controller which shall:
 - 1) Provide for compressor staging.
 - 2) Include an adjustable set point discharge air temperature control.
 - 3) Contain a memory function to provide stable discharge air temperature.
 - 4) Program a reset of discharge air temperature based on average room temperatures.
 - 5) Contain a control band adjustment to control compressor loading rate and match number of control stages.
 - 6) Provide a capability to incorporate an integrated hydronic economizer or field-supplied air economizer.

Guide specifications — 50BJ016-034 (cont)

- 2. Safeties:
 - a. Compressor shall be provided with the following minimum protection:
 - 1) High pressure
 - 2) Low pressure
 - 3) Over-temperature
 - 4) Overcurrent (circuit breakers)
 - 5) Short cycle (minimum 5 minutes)
 - b. Indoor fan motor shall have inherent automatic reset thermal overload protection.
- I. Refrigerant Components:

Refrigerant circuit components shall include.

 - 1. Thermal expansion valve
 - 2. Filter drier
 - 3. Compressor service valves
 - 4. Hot gas and liquid line shut-off valves
 - 5. Liquid line sight glass
 - 6. Discharge line muffler
- J. Electrical Requirements:
 - 1. All electrical wiring shall enter the unit cabinet at a single location.
- K. Special Features:

Certain standard features are not applicable when the features designated by * are specified. For assistance in amending the specifications, your local Carrier Sales Office should be contacted.

 - 1. Hydronic Reheat Coil (15 and 20 tons only)
 - a. Steam distributing coil shall be one row or 2 rows of copper tube aluminum spiral fins and a galvanized steel casing. Coil shall be factory supplied for field installation
 - b. Hot water coil shall be 2-row copper tube aluminum fins with a galvanized steel casing. Coil shall be factory supplied for field installation.
 - 2. Return air inlet grille (15 and 20 tons only):

Shall be factory furnished in matching style.
 - 3. Timer Control Package:

Shall provide a 7-day clock with 10-hour spring carry-over, a 5-hour bypass timer and indicating lights for power-on, fan and cooling modes. For field installation.
 - 4. Hydronic Economizer Package:

Unit shall include a factory-installed hydronic economizer complete with 4-row precooling coil, coil casing, filter section with disposable filters, drain pan and outer casing.
 - 5. Hydronic Economizer with Preheat Coils Package:

Unit shall include a factory-installed hydronic economizer complete with 4-row precooling coil, 2-row hot water preheat coil, coil casing, filter section with disposable filters, drain pan and outer casing.
 - 6. Piping Package:

Hydronic economizer unit shall be factory fitted with 3-way bypass valve, 2-way water regulator valve, aquastat, piping, all control wiring to micro-processor control and a cabinet enclosure.

Guide specifications — 50BJ044-064

Indoor Packaged Unit Variable Volume Application — Water-Cooled

HVAC Guide Specifications — Section 15787

Size Range: **40-60 Tons, Nominal**

Carrier Model Number: **50BJ**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Indoor vertical, water cooled, microprocessor controlled cooling packaged unit utilizing reciprocating semi-hermetic compressors for cooling. Unit shall supply air vertically or horizontally as shown on the contract drawings.

1.02 QUALITY ASSURANCE

- A. Unit shall be designed to conform to ANSIB9.1.
- B. Unit shall be ETL listed and CSA certified.
- C. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

1.03 DELIVERY, STORAGE AND HANDLING

- A. To be per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory assembled single piece, vertical, water cooled cooling unit. The unit shall consist of tube-in-tube type condensers, serviceable hermetic compressor(s), fan section complete with centrifugal fan and motor mounting bracket, coil section complete with direct-expansion coil, drain pan and filter track, factory wiring, piping and controls. An operating charge of refrigerant (R-22) shall be furnished.

B. Unit Cabinet:

- 1. Cabinet shall be constructed of zinc surface alloyed steel with a baked enamel decorative finish.
- 2. Cabinet shall be fully insulated with a fire retardant material.

C. Fan Section:

- 1. Double inlet centrifugal fan wheel with forward curved blades shall be designed for continuous operation at maximum fan speed. Fan wheel and scroll shall be constructed of steel with corrosion resistant finish and shall be statically and dynamically balanced.
- 2. Fan shall be belt-driven and drive shall include a fixed pitch motor pulley.
- 3. Bearings shall be sealed, permanently lubricated, ball bearing type.

D. Compressors:

- 1. Serviceable hermetic type.
- 2. Factory mounted on spring vibration isolators.
- 3. Equipped with a factory-installed crankcase heater to minimize liquid refrigerant accumulation in com-

pressor during shutdown and prevent refrigerant dilution of oil.

E. Coils:

- 1. Evaporator coil shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.
- 2. Tube sheet openings shall be belled to prevent tube wear.
- 3. Evaporator coil shall be of the full face active design.
- 4. Heating coils optional (Special Features Section).
- 5. Direct-expansion coils shall be designed and tested in accordance with ANSI/ASHRAE 15 Safety Code for mechanical refrigeration.

F. Condenser:

- 1. The condenser shall be of the tube-in-tube type.
- 2. Tubes shall be seamless with no internal joints.
- 3. Condenser shall have a maximum working pressure of 400 psig on the water side.

G. Operating Characteristics:

- 1. Unit shall be capable of providing a variable volume of air at a specified external static pressure within the units normal operation range.
- 2. Unit shall have multi-stage cooling capacity control.

H. Controls and Safeties:

1. Unit Controls:

- a. A unit mounted switch shall be provided for system off-on operation.
- b. Unit shall have a factory installed and wired discharge air control system based on a micro-processor controller which shall:
 - 1) Provide for compressor staging.
 - 2) Include an adjustable set point discharge air temperature control.
 - 3) Contain a memory function to provide stable discharge air temperature.
 - 4) Program a reset of discharge air temperature based on average room temperatures.
 - 5) Contain a control band adjustment to control compressor loading rate and match number of control stages.
 - 6) Provide a capability to incorporate an integrated hydronic economizer or field supplied air economizer.

2. Safeties:

- a. Compressor shall be provided with the following minimum protection:
 - 1) High pressure
 - 2) Low pressure
 - 3) Over-temperature
 - 4) Overcurrent (circuit breaker)
 - 5) Short cycle (minimum 5 minutes)
- b. Indoor fan motor shall have inherent automatic reset thermal overload protection.

Guide specifications — 50BJ044-064 (cont)

I. Refrigerant Components:

Refrigerant circuit components shall include:

1. Thermal-expansion valve
2. Filter drier
3. Compressor service valves
4. Liquid line shut-off valves
5. Liquid line sight glass
6. Discharge line muffler

J. Electrical Requirements:

1. All electrical wiring shall enter the unit cabinet at a single location.

K. Special Features:

Certain standard features are not applicable when the features designated by * are specified. For assistance in amending the specifications, your local Carrier Sales Office should be contacted.

1. Timer Control Package:

Shall provide a 7-day clock with 10-hour spring carry-over, a 5-hour bypass timer and 3 indicating lights for power-on, fan and cooling modes. For field installation.

2. Hydronic Economizer Package:

Unit shall include a factory-installed hydronic economizer complete with 4-row precooling coil, coil casing, filter section with disposable filters, drain pan and outer casing.

3. Hydronic Economizer with Preheat Coil Package:

Unit shall include a factory-installed hydronic economizer complete with 4-row precooling coil, 2-row hot water preheat coil, coil casing, filter section with disposable filter, drain pan and outer casing.

4. Hydronic Economizer Piping Package:

Unit shall be factory fitted with a 3-way bypass valve, 2-way water regulator valve, aquastat, piping, all control wiring to microprocessor control and a cabinet enclosure

5. Mixing Box Section:

Mixing boxes shall have parallel blade, interconnecting outside-air and return-air dampers. Damper blades shall have parallel bends for stiffness and shall be welded to ½-in. diameter steel rods rotating in nylon bushings and mounted in rigid galvanized steel frames. Dampers shall be sectionalized to limit blade length to no more than 50 in. to minimize blade warpage and to assure tight closure.

6. Filter Sections:

- a. Low velocity filter sections shall accept 16-in. x 25-in. x 2-in. cleanable or throwaway filters arranged in a horizontal "V" formation. Hinged access doors shall be provided on both sides.
- b. Flat high velocity filter sections shall accept 16-in. x 25-in. x 2-in. or 4-in. cleanable or throwaway filters. Filters shall be installed vertically such as to provide the maximum face area in the direction of airflow. Sections shall include side access slide rails with access panels on both sides.

- c. Bag filter sections for installation on the upstream side of a fan shall be capable of accepting standard 2-in. thick prefilters and a combination of 12-in. x 24-in. 24-in. bag filters up to a length of 23 inches. Bag filter sections shall have hinged access doors on both sides.

- d. Roll filter section shall be supplied by the unit manufacturer to be directly attached to other sections without modification or the use of adapter sections. An initial roll of filter media shall be furnished with each section.

- 1) The roll filter section shall house the supply spool, take-up spool, media track, motor and gear drive assembly. The drive motor shall be 1/10-hp, 115 v, single phase, 60 Hz. Access doors shall be provided on both sides of the filter section.

- 2) The media advance mechanism shall be controlled either manually or automatically in response to the static pressure differential across the filter media. A runout switch shall monitor the media. The control shall incrementally advance the media during each operating cycle. Indicating and operating lights shall be included. All controls shall be prewired at the unit manufacturer's factory

7. Access and Plenum Sections:

- a. Access and plenum sections shall be installed where indicated on the drawings and shall be as specified on the equipment schedule.
- b. Access sections shall be constructed with hinged doors on both sides.

8. Preheat Coil Sections:

Coil sections shall be equipped with heavy duty tracks extending the full width of the unit to facilitate easy installation and removal of coils (slip-in, slip-out). Sections will contain either of the following coil types:

- a. U-Bend heating coil for hot water or steam application shall have aluminum plate fins, ½-in. OD copper tubes and steel headers with threaded supply connections. Headers shall have vent and drain connections. Working pressure shall be 175 psig at 400 F.
- b. Steam distributing coil (non-freeze type) shall have an outer tube diameter of one-in. with a 5/8-in. diameter inner distributing tube. Spiral fins shall be aluminum and headers shall be steel. Working pressure shall be 175 psig at 400 F.

9. Inlet Guide Vanes:

Optional inlet guide vanes and controls shall be factory installed.

10. Mechanically Cleanable Condenser:

- a. The condenser shall be of the shell-in-tube type.
- b. Tubes shall be seamless with no internal joints.
- c. Condenser shall have a maximum working pressure of 150 psig on the water side.

Guide specifications — 50BK016-034

Indoor Packaged Unit

Variable Volume Application — Condenserless

HVAC Guide Specifications — Section 15787

Size Range: **15-30 Tons, Nominal**

Carrier Model Number: **50BK**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Indoor vertical, condenserless, microprocessor controlled cooling packaged unit utilizing a reciprocating semi-hermetic compressor(s). Unit shall supply air through ductwork as shown on the contract drawings.

1.02 QUALITY ASSURANCE

- A. Unit shall be designed to conform to ANSI B9.1.
- B. Unit shall be ETL listed. Unit shall be CSA certified.
- C. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

1.03 DELIVERY, STORAGE AND HANDLING

- A. To be per manufacturer's recommendations

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory assembled single piece, vertical, condenserless cooling unit. The unit shall consist of serviceable hermetic compressor(s), fan section complete with centrifugal fan and motor mounting bracket, coil section complete with direct-expansion coil, drain pan and filter track, factory wiring, piping and controls. A holding charge of refrigerant (R-22) shall be furnished.

B. Unit Cabinet:

- 1. Cabinet shall be constructed of zinc surface alloyed steel with a baked enamel decorative finish.
- 2. Cabinet shall be fully insulated with a fire retardant material.

C. Fan Section:

- 1. Double inlet centrifugal fan wheel for forward curved blades shall be designed for continuous operation at maximum fan speed. Fan wheel and scroll shall be constructed of steel with corrosion resistant finish and shall be statically and dynamically balanced.
- 2. Fan shall be belt-driven and drive shall include an adjustable pitch motor pulley (15 and 20 tons only) or a fixed pitch motor pulley.
- 3. Bearings shall be sealed, permanently lubricated, ball bearing type.

D. Compressor(s):

- 1. Serviceable hermetic type.
- 2. Factory mounted on spring vibration isolators.

- 3. Equipped with a factory-installed crankcase heater to minimize liquid refrigerant accumulation in compressor during shutdown and prevent refrigerant dilution of oil.

E. Coils:

- 1. Evaporator coil shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.
- 2. Tube sheet openings shall be belled to prevent tube wear.
- 3. Evaporator coil shall be of the full face active design.
- 4. Heating coils optional (Special Features Section)
 - a. 2-row hot water reheat coil
 - b. One-row steam distributing type reheat coil
 - c. 2-row hot water preheat coil
- 5. Direct-expansion coils shall be designed and tested in accordance with ANSI/ASHRAE 15 Safety Code for mechanical refrigeration.
- 6. Hydronic heating coils shall be factory tested for leakage at 350 psig air pressure with the coil submerged in water. After testing the coil shall be dehydrated and charged with dry air.
- 7. A filter frame designed to accept standard 2-in. cleanable or disposable filters shall be installed upstream of the cooling coil. Disposable filters shall be supplied with the unit.

F. Operating Characteristics:

- 1. Unit shall be capable of providing a variable volume of air at a specified external static pressure within the unit's normal operating range.
- 2. Unit shall have multi-stage cooling capacity control.

G. Controls and Safeties:

1. Unit Controls:

- a. A unit mounted system switch shall be provided for on-off operation.
- b. An electrical interlock for remote condenser fan shall be provided.
- c. Unit shall have a factory-installed and wired discharge air control system based on a microprocessor controller which shall:
 - 1) Provide for compressor staging.
 - 2) Include an adjustable set point discharge air temperature control
 - 3) Contain a memory function to provide stable discharge air temperature.
 - 4) Program a reset of discharge air temperature based on average room temperatures.
 - 5) Contain a control band adjustment to control compressor loading rate and match number of control stages.
 - 6) Provide a capability to incorporate an integrated field-supplied air economizer.

Guide specifications — 50BK016-034 (cont)

2. Safeties:

- a. Compressor shall be provided with the following minimum protection:
 - 1) High pressure
 - 2) Low pressure
 - 3) Over-temperature
 - 4) Overcurrent (circuit breaker)
 - 5) Short cycle (minimum 5 minutes)
- b. Indoor fan motor shall have inherent automatic reset thermal overload protection.

H. Refrigerant Components:

Refrigerant circuit components shall include:

1. Thermal expansion valve
2. Filter drier
3. Compressor service valves
4. Hot gas and liquid shut-off valves
5. Liquid line sight glass
6. Discharge line muffler
7. Liquid line solenoid valve

I. Electrical Requirements:

1. All electrical wiring shall enter the unit cabinet at a single location.

J. Special Features:

Certain standard features are not applicable when the features designated by * are specified. For assistance in amending the specifications, your local Carrier Sales Office should be contacted.

1. Hydronic Reheat Coil (15 and 20 tons only):

- a. Steam distributing coil shall be one row or 2 rows of copper tube aluminum spiral fins and a galvanized steel casing. Coil shall be factory supplied for field installation.
 - b. Hot water coil shall be 2-row copper tube aluminum fins with a galvanized steel casing. Coils shall be factory supplied for field installation.
2. Return air inlet grille (15 and 20 tons only): Shall be factory furnished in matching style.
 3. Timer Control Package:

Shall provide a 7-day clock with 10-hour spring carry-over, a 5-hour bypass timer and 3 indicating lights for power-on, fan and cooling modes. For field installation.

Guide specifications — 50BK044-064

Indoor Packaged Unit

Variable Volume Application — Condenserless

HVAC Guide Specifications — Section 15787

Size Range: **40-60 Tons, Nominal**

Carrier Model Number: **50BK**

Part 1 — General

1.01 SYSTEM DESCRIPTION

- A. Indoor vertical, condenserless, microprocessor controlled cooling packaged unit utilizing reciprocating semi-hermetic compressors for cooling. Unit shall supply air vertically or horizontally as shown on the contract drawings.

1.02 QUALITY ASSURANCE

- A. Unit shall be designed to conform to ANSI B9.1.
- B. Unit shall be ETL listed and CSA certified.
- C. Insulation and adhesive shall meet NFPA 90A requirements for flame spread and smoke generation.

1.03 DELIVERY, STORAGE AND HANDLING

- A. To be per manufacturer's recommendations.

Part 2 — Products

2.01 EQUIPMENT

A. General:

Factory assembled single piece, vertical condenserless cooling unit. The unit shall consist of serviceable hermetic compressors, fan section complete with centrifugal fan and motor mounting bracket, coil section complete with direct-expansion coil, drain pan and filter track, factory wiring, piping and controls. A holding charge of refrigerant (R-22) shall be furnished.

B. Unit Cabinet:

- 1. Cabinet shall be constructed of zinc surface alloyed steel with a baked enamel decorative finish.
- 2. Cabinet shall be fully insulated with a fire retardant material.

C. Fan Section:

- 1. Double inlet centrifugal fan wheel with forward curved blades shall be designed for continuous operation at maximum fan speed. Fan wheel and scroll shall be constructed of steel with corrosion resistant finish and shall be statically and dynamically balanced.
- 2. Fan shall be belt-driven and drive shall include a fixed pitch motor pulley.
- 3. Bearings shall be sealed, permanently lubricated, ball bearing type.

D. Compressors:

- 1. Serviceable hermetic type.
- 2. Factory mounted on spring vibration isolators.

- 3. Equipped with a factory-installed crankcase heater to minimize liquid refrigerant accumulation in compressor during shutdown and prevent refrigerant dilution of oil.

E. Coils:

- 1. Evaporator coil shall have aluminum plate fins mechanically bonded to seamless copper tubes with all joints brazed.
- 2. Tube sheet openings shall be belled to prevent tube wear.
- 3. Evaporator coil shall be of the full face active design.
- 4. Heating coils optional (Special Features Section)
- 5. Direct-expansion coils shall be designed and tested in accordance with ANSI/ASHRAE 15 Safety Code for mechanical refrigeration.

F. Operating Characteristics:

- 1. Unit shall be capable of providing a variable volume of air at a specified external static pressure within the units normal operating range.
- 2. Unit shall have multi-stage cooling capacity control.

G. Controls and Safeties:

1. Unit Controls:

- a. A unit mounted switch shall be provided for system off-on operation
- b. On electrical interlock for remote condenser fan shall be provided.
- c. Unit shall have a factory-installed and wired discharge air control system based on a microprocessor controller which shall:
 - 1) Provide for compressor staging.
 - 2) Include an adjustable set point discharge air temperature control.
 - 3) Contain a memory function to provide stable discharge air temperature.
 - 4) Program a reset of discharge air temperature based on average room temperatures.
 - 5) Contain a control band adjustment to control compressor loading rate and match number of control stages.
 - 6) Provide a capability to incorporate a field-supplied air economizer.

2. Safeties:

- a. Compressor shall be provided with the following minimum protection:
 - 1) High pressure
 - 2) Low pressure
 - 3) Over-temperature
 - 4) Overcurrent (circuit breaker)
 - 5) Short cycle (minimum 5 minutes)
- b. Indoor fan motor shall have inherent automatic reset thermal overload protection.

Guide specifications — 50BK044-064 (cont)

H. Refrigerant Components:

Refrigerant circuit components shall include

1. Thermal expansion valve
2. Filter drier
3. Compressor service valves
4. Liquid line shut-off valves
5. Liquid line sight glass
6. Discharge line muffler
7. Liquid line solenoid valve

I. Electrical Requirements:

1. All electrical wiring shall enter the unit cabinet at a single location.

J. Special Features:

Certain standard features are not applicable when the features designated by * are specified. For assistance in amending the specifications, your local Carrier Sales Office should be contacted.

1. Winter Start Package:

Shall provide for a time delay of low pressure at start under low ambient conditions.

2. Timer Control Package:

Shall provide a 7-day clock with 10-hour spring carry-over, a 5-hour bypass timer and 3 indicating lights for power-on, fan and cooling modes. For field installation.

3. Mixing Box Section:

Mixing boxes shall have parallel blade, inter-connecting outside-air and return-air dampers. Damper blades shall have parallel bends for stiffness and shall be welded to ½-in. diameter steel rods rotating in nylon bushings and mounted in rigid galvanized steel frames. Dampers shall be sectionalized to limit blade length to no more than 50 in. to minimize blade warpage and to assure tight closure

4. Filter Sections:

- a. Low velocity filter sections shall accept 16-in. x 25-in. x 2-in. cleanable or throwaway filters arranged in a horizontal "V" formation. Hinged access doors shall be provided on both sides.
- b. Flat high velocity filter sections shall accept 16-in. x 25-in. x 2-in. or 4-in. cleanable or throwaway filters. Filters shall be installed vertically such as to provide the maximum face area in the direction of airflow. Sections shall include side access slide rails with access panels on both sides.
- c. Bag filter sections for installation on the upstream side of a fan shall be capable of accept-

ing standard 2-in. thick prefilters and a combination of 12-in. x 24-in. x 24-in. bag filters up to a length of 23 inches. Bag filter sections shall have hinged access doors on both sides.

- d. Roll filter section shall be supplied by the unit manufacturer to be directly attached to other sections without modification or the use of adapter sections. An initial roll of filter media shall be furnished with each section.

- 1) The roll filter section shall house the supply spool, take-up spool, media track, motor and gear drive assembly. The drive motor shall be 1/10-hp, 115 v, single phase, 60 Hz. Access doors shall be provided on both sides of the filter section.

- 2) The media advance mechanism shall be controlled either manually or automatically in response to the static pressure differential across the filter media. A runout switch shall monitor the media. The control shall incrementally advance the media during each operating cycle. Indicating and operating lights shall be included. All controls shall be prewired at the unit manufacturer's factory.

5. Access and Plenum Sections:

- a. Access and plenum sections shall be installed where indicated on the drawings and shall be as specified on the equipment schedule.
- b. Access sections shall be constructed with hinged doors on both sides.

6. Preheat Coil Sections:

Coil sections shall be equipped with heavy duty tracks extending the full width of the unit to facilitate easy installation and removal of coils (slip-in, slip-out). Sections will contain either of the following coil types:

- a. U-Bend heating coil for hot water or steam application shall have aluminum plate fins, ½-in. OD copper tubes and steel headers with threaded supply connections. Headers shall have vent and drain connections. Working pressure shall be 175 psig at 400 F.
- b. Steam distributing coil (non-freeze type) shall have an outer tube diameter of one in. with a ⅝-in. diameter inner distributing tube. Spiral fins shall be aluminum and headers shall be steel. Working pressure shall be 175 psig at 400 F.

7. Inlet Guide Vanes.

Optional inlet guide vanes and controls shall be factory installed.

