

# Appliance Cross Reference Data For Hermetic Compressors

## Simple But Important Tips:

- Use two stage rotary vacuum pump of minimum 50 LPM capacity.
- Remove compressor tube rubber plugs just 10 minutes prior to brazing.
- Use trichloroethylene to flush the components.
- Use bright annealed copper tubes and keep all coils and tubes Nitrogen charged & sealed.
- Use separate set of gauges, hoses, cylinders for different refrigerant and keep them labeled.



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A10B03-020200112

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Dear Customer,

Greetings from Emerson Climate Technologies!

This folder is intended to serve as a Quick reference guide to refrigeration system component sizing. We strongly recommend the users to look at these details as a 'starting point', while building new refrigeration appliances. The system needs to be qualified in a test room with controlled ambient temperature and product load conditions to finalize the system component specs.

System details mentioned in this folder are initial recommendations and may need fine-tuning for optimum appliance performance. For standard appliances, the optimum system operating parameters are provided at appropriate places, for reference.

Other than the evaporator and condenser sizing, using the correct length of capillary tubing and appropriate amount of refrigerant charge becomes a critical element of system balancing.

We recommend the users to start with the capillary tubing suggested in this folder and suitably balance the refrigeration system, following below guideline:

Observed Parameters			System Problem
High Superheat	Low Sub Cooling	-	Low Charge
Low Superheat	High Sub Cooling	-	High Charge
High Superheat	High Sub Cooling	-	Capillary Tube to Restrictive
Low Superheat	Low Sub Cooling	Higher evaporating temperature	Capillary Tube Not Restrictive Enough
Low Superheat	Low Sub Cooling	Low evaporating temperature	Inadequate Indoor Coil Or Air Flow

For any more clarifications or support, please contact your nearest Emerson Climate sales representative or Technical Help Desk on 1800-209-1700.

Warm regards,

Technical Support Team

Colour Scheme of Refrigerants



## Water Cooler

R134a Models	KCE419HAG	KCE444HAG KCJ444HAG	KCJ467HAG KCN463HAG	KCJ498HAG	KCM511CAL	KCM514CAL #	KCM522CAL #
R22 Models	-	KCE443HAE	KCE461HAE	KCJ511HAE #	KCJ513HAE #	CR22K6M #	CR30K6M #
*Capacity Ltrs./Hr.	20	40	60	100	150	200	300
Condenser Size (inch) (Length x Height) 3/8" O.D. Tube 10-12FPI	9 x 9 x 2 ROWS	11 x 10 x 3 ROWS	13 x 12 x 3 ROWS	18 x 15 x 2 ROWS	22 x 16 x 2 ROWS	22 x 16 x 3 ROWS	22 x 16 x 4 ROWS
Condenser Fan Motor	1/83 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/20 HP x 1,350 RPM	1/20 HP x 930 RPM	1/12 HP x 930 RPM	1/5 HP x 930 RPM	1/4 HP x 1,350 RPM
Condenser Fan	8"DIA X 4 BLADE	9"DIA X 4 BLADE	10"DIA X 4 BLADE	12 1/2"DIA X 6 BLADE	15"DIA X 6 BLADE	15"DIA X 6 BLADE	15"DIA X 6 BLADE
Evaporator Size O.D Tube (inch) x Length (ft)	5/16 x 30	3/8 x 50	3/8 x 70	3/8 x (45x2 Circuit)	3/8 x (65x2 Circuit)	3/8 x (95x2 Circuit)	3/8 x (125x2 Circuit)
Capillary Tube Bore x Length	0.050" x 10 ft. x 1 NO.	0.050" x 5 ft. x 1 NO.	0.050" x 5 ft. x 2 NO.	0.055" x 39" x 2 NO.	0.055" x 31" x 2 NO.	0.064" x 29" x 2 NO.	0.064" x 28" x 2 NO.

\*Capacity as per IS 1475 Standard.

NOTE: # While using these compressor models in storage type water coolers, start capacitors and start relay need not to be used.



Dixell Controller Model - XR40CX  
(Suitable for all above compressor models)



### Typical System Operating Parameters

Parameters	R134a		R22	
	Ambient Temperature (°C)	35	43	35
Suction Pressure (psig) (Bar)	33 to 38 2.2 to 2.6	47 to 50 3.2 to 3.4	70 to 72 4.8 to 4.9	85 5.8
Discharge Pressure (psig) (Bar)	165 to 175 11 to 12	185 to 200 12.7 to 13.7	280 to 290 19 to 20	380 26
Return Gas Temperature (°C)	16	21	10 to 13	21
• Top Shell Temperature (°C)	43 to 60	49 to 71	36 to 46	50 to 56

• Shell temp could slightly vary with different platform models like KCE, KCJ, KCM, CR.

## Chest Type Bottle Cooler

R134a Models	KCE 419HAG	KCE425HAG	KCE432HAG	KCE444HAG	KCN463HAG	KCJ498HAG
		KCN413HAG	KCN416CAG	KCJ444HAG	KCJ467HAG	
R22 Models	-	-	-	KCE443HAE	KCE461HAE	KCJ511HAE*
R404A Models	-	-	-	KCJ422CAL	KCJ438CAL	KCJ461CAL
No. of 250ml Bottles	120-140	150-200	220-250	260-310	360-430	650-800
Cabinet Volume(Ltrs)	110-120	130-160	200-220	240-260	330-360	700-800
Condenser Size (inch) (Length x Height) 3/8"O.D.Tube 10-12FPI	9 x 9 x 2 ROWS	10 x 11 x 2 ROWS	10 x 9 x 3 ROWS	13 x 12 x 2 ROW (OR) 11" x 10 x 3 ROWS	13 x 12 x 3 ROWS	14 x 14 x 4 ROWS
Condenser Fan Motor	1/83 HP x 1,350 RPM	1/50 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/20 HP x 1,350 RPM	1/20 HP x 1,350 RPM
Condenser Fan	8"DIA	10"DIA	8"DIA	10"DIA	10"DIA	12"DIA
Evaporator Size O.D Tube(inch) x Length(ft)	5/16 x 30	5/16 x 40	3/8 x 50	3/8 x 60	3/8 x 85	3/8 x (70x2Circuit)
Capillary Tube Bore x Length	0.044" x 10 ft x 1NO.	0.044" x 10 ft x 1NO.	0.046" x 9 ft x 1NO.	0.050" x 8 ft x 1NO. For KCE443HAE 0.05" x 55" x 1 NO.	0.050" x 8 ft x 1 NO.	0.050" x 55" x 2 NO.

\* Use with only CSCR circuit



Dixell Controller Model - XR35CX  
(Suitable for all above compressor models)



### Typical System Operating Parameters

Parameters	R134a		R22		R404A	
	Ambient Temperature (°C)	35	43	35	43	35
Suction Pressure (psig) (Bar)	18 to 20 1.2 to 1.3	30 to 32 2 to 2.2	40 to 43 2.7 to 3	55 3.8	50 to 55 3.4 to 3.8	65 4.4
Discharge Pressure (psig) (Bar)	164 to 174 11 to 12	187 to 199 12.7 to 13.7	280 to 290 19 to 20	380 26	355 24	455 31
Return Gas Temperature (°C)	16	21	10 to 13	21	13 to 15	24
• Top Shell Temperature (°C)	43 to 60	49 to 71	36 to 46	50 to 56	38 to 48	52 to 58

• Shell temp could slightly vary with different platform models like KCJ, KCN, KCE

## Air-conditioner

R22 Models	KCJ511HAE	KCJ513 HAE	CR22K6M	CR30K6M
Cooling Capacity	0.75 TR	1 TR	1.5 TR	2 TR
Condenser Size (inch) (Length x Height) 3/8"O.D. Tube 13FPI	18" x 15" x 2 ROWS	22" x 16" x 2 ROWS	22" x 16" x 3 ROWS	22" x 16" x 4 ROWS
Condenser Fan Motor	1/12 HP x 930 RPM	1/10 HP x 930 RPM	1/5 HP x 930 RPM	1/4 HP x 1,350 RPM
Condenser Fan	12 1/2" DIA. x 6 BLADE	13 1/2" DIA x 6 BLADE	16" DIA x 6 BLADE	16" DIA x 6 BLADE
Evaporator / Condenser Air Flow Qty.	300/600 CFM	375/750 CFM	450/940 CFM	625/1,200 CFM
Evaporator Size (inch) (Length x Height) 3/8"O.D. Tube 13FPI	14 x 14 x 2 ROWS	15 x 15 x 2 ROWS	15 x 15 x 3 ROWS	15 x 15 x 4 ROWS
Evaporator Blower	7" DIA x 3 1/4"W	7" DIA x 3 1/4"W	8 1/2" DIA x 4"W	8 1/2" DIA x 4"W
Capillary Tube Bore x Length	0.055" x 22" x 1 NO. (OR) 0.055" x 40" x 2 NO.	0.055" x 32" x 2 NO.	0.064" x 30" x 2 NO.	0.064" x 28" x 2 NO.



Dixell Controller Model - IC200CX  
(Suitable for all above compressor models)



### Typical System Operating Parameters

Parameters	R22	
	Ambient Temperature (°C)	35
Suction Pressure (psig) (Bar)	70 to 72 4.8 to 4.9	85 5.8
Discharge Pressure (psig) (Bar)	280 to 290 19 to 20	380 26
Return Gas Temperature (°C)	10 to 13	21
• Top Shell Temperature (°C)	36 to 46	50 to 56

• Shell temp could slightly vary with different platform models like KCJ, CR.

## Deep Freezer

R134a Models	KCN372LAG	KCJ412LAG	KCN415LAG	-	KCJ423LAG	-
	KCN396LAG	KCN411LAG				
R404A Models	-	-	KCN414LAL	KCN418LAL	KCN422LAL KCJ430LAL	KCJ450LAL
*Nominal Capacity Hard Top (Ltrs.)	300 / 400	450	500	600	800 / 1,100	1,800
*Nominal Capacity Glass Top (Ltrs.)	200 / 300	300	400	500	700 / 1,000	1,700
Condenser Size (inch) (Length x Height) 3/8" O.D. Tube 13FPI	9 x 9 x 2 ROWS	11 x 10 x 2 ROWS	13 x 13 x 2 ROWS	13 x 13 x 3 ROWS	14 x 14 x 4 ROWS	18 x 16 x 4 ROWS
Condenser Fan Motor	1/83 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/20 HP x 1,350 RPM	1/5 HP x 1,350 RPM
Condenser Fan	9"DIA	9"DIA	9"DIA	12"DIA	12"DIA	15"DIA
Evaporator Size O.D Tube (inch) x Length(ft)	5/16 x 30	3/8 x 60	3/8 x 85	3/8 x 95	3/8 x (65x2 Circuit)	1/2 x (100x2 Circuit)
Capillary Tube Bore x Length	0.031" x 12' x 1NO.	0.036" x 12' x 1NO.	0.044" x 8' x 1NO.	0.050" x 8' x 1NO.	0.050" x 10' x 1NO.	0.044" x 10' x 2NO.

NOTE : \* These compressors can also be suitable for slightly higher capacity deep freezers with very effective insulation, high conductivity inner cabinet material, good evaporator bonding & a very well balanced refrigeration system.



Dixell Controller Model - XR60C  
(Suitable for all above compressor models)



### Typical System Operating Parameters

Parameters	R134a		R404A	
	Ambient Temperature (°C)	32	43	32
Suction Pressure (psig) (Bar)	1 to 2 0 to 0.1	0 to 5 0 to 0.3	22 to 24 1.5 to 1.6	21 to 31 1.4 to 2.1
Discharge Pressure (psig) (Bar)	160 11	175 to 190 12 to 13	293 20	316 to 340 22 to 23
Return Gas Temperature (°C)	10	18.3	10	18.3
• Top Shell Temperature (°C)	66	77	66	77

• Shell temp. could slightly vary with different platform models like KCJ, KCN

## Visi Cooler

R134a Models	KCE 419HAG	KCE425HAG	KCE432HAG	KCE444HAG	KCN463HAG
		KCN413CAG	KCN416CAG	KCJ444HAG	
No. Of Case(Lit)	2(110)	4(150)	7(250)	9(400)	9(650)
Condenser Size (inch) (Length x Height) 3/8" O.D. Tube 6-11FPI	10 x 9 x 2 ROWS	11 x 10 x 2 ROWS	10 x 9 x 3 ROWS	11 x 10 x 3 ROWS	13 x 12 x 3 ROWS
Condenser Fan Motor	1/83 HP x 1,350 RPM	1/50 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/20 HP x 1,350 RPM
Condenser Fan	8"DIA	9"DIA	8"DIA X 5 BLADE	9"DIA X 5 BLADE	12"DIA X 4 BLADE
Evaporator Size (Inch) (Length x Height) 3/8" O.D. Tube, 6-11 FPI	11 x 10 x 2 ROWS	12 x 11 x 2 ROWS	14 x 12 x 2 ROWS	17 x 14 x 2 ROWS	17 x 14 x 3 ROWS
Capillary Tube Bore x Length	0.044" x 10' x 1 NO.	0.044" x 10' x 1 NO.	0.046" x 9' x 1 NO.	0.050" x 7' x 1 NO.	0.050" x 8' x 1 NO.



Dixell Controller Model - XR60C  
(Suitable for all above compressor models)



### Typical System Operating Parameters

Parameters	R134a	
	Ambient Temperature (°C)	35
Suction Pressure (psig) (Bar)	18 to 20 1.2 to 1.3	30 to 32 2 to 2.2
Discharge Pressure (psig) (Bar)	164 to 174 11 to 12	187 to 199 12.7 to 13.7
Return Gas Temperature (°C)	16	21
• Top Shell Temperature (°C)	43 to 60	49 to 71

• Shell temp. could slightly vary with different platform models like KCJ, KCN, KCE

## Softy Ice- Cream Machine

R134aModels	KCJ423LAG	-	-	-	-	-
R404A Models	KCJ430LAL	KCJ450LAL	KCM511CAL	KCM514CAL	KCM519CAL	KCM522CAL
Capacity Of Churner (Ltrs.)	5 to 10	10 to 15	15 to 20	20 to 25	25 to 35	30 to 40
Condenser Size (inch) (Length x Height) 3/8"O.D. Tube 13FPI	14 x 14 x 4 ROWS	18 x 16 x 4 ROWS	22 x 18 x 3 ROWS	22 x 18 x 4 ROWS	22 x 20 x 4 ROWS	24 x 22 x 4 ROWS
Condenser Fan	1,350 RPM, 12"DIA	1,350 RPM, 14"DIA	1,300 RPM, 16"DIA	1,300 RPM, 16"DIA	1,400 RPM, 18"DIA	1,400 RPM, 18"DIA
Evaporator Size O.D Tube (inch) x Length(ft)	1/2 x 15	1/2 x 25	1/2 x 30	1/2 x 40	1/2 x 54	1/2 x 60
Capillary Tube Bore x Length	0.050" x 7 ft x 2NO.	0.060" x 6 ft x 2NO.	0.060" x 6 ft x 2NO.	0.060" x 5 ft 6" x 2NO.	0.060" x 5 ft x 2NO.	0.060" x 4 ft 6" x 2NO.



Dixell Controller Model - XR20C  
(Suitable for all above compressor models)



## Water Chiller

R134a Models	-	KCM519CAL	KCM522CAL	-	-	-	-	-	-	-
R22 Models	-	CR22K6M	CR30K6M	CR36K6M	CR42K6M	CR47KQM	CR53KQM	CR57KQM	CR62KQM	CR72KQM
R404A Models	KCJ484CAL	KCM511CAL	KCM514CAL	KCM519CAL	KCM522CAL	-	-	-	-	-
Approx. Chilled Water Flow Rate(LPH) *	600	830	1,000	1,400	1,600	1,800	2,000	2,200	2,400	2,600
Compressor Capacity # (Btu/Hr)	-	15,528	17,822	-	-	-	-	-	-	-
	-	16,200	21,800	25,900	31,100	36,100	40,648	42,600	47,000	52,240
	11,412	16,500	21,400	27,200	31,500	-	-	-	-	-
Condenser Size (inch) (Length x Height) 3/8"O.D. Tube 13FPI	20 x 16 x 3 ROWS	22 x 18 x 3 ROWS	22 x 20 x 3 ROWS	22 x 20 x 4 ROWS	24 x 22 x 4 ROWS	34 x 28 x 3 ROWS	34 x 32 x 3 ROWS	33 x 26 x 4 ROWS	36 x 26 x 4 ROWS	40 x 26 x 4 ROWS
Condenser Fan	14" DIA, 1300 RPM	14" DIA, 1300 RPM	15" DIA, 1300 RPM	15" DIA, 1400 RPM	18" DIA, 1400 RPM	16" DIA, 1400 RPM	16" DIA, 1400 RPM x 2NO.	16" DIA, 1800 RPM x 2NO.	16" DIA, 1800 RPM x 2NO.	19" DIA, 1800 RPM x 2NO.
Evaporator Type	Select suitable model of BPHE/Shell & Tube HE from your known reliable source									
Coil in Tank Type Evaporator Length(ft) x O.D Tube (inch)	130 x 3/8 (65x2 Circuit)	200 x 3/8 (100x2 Circuit)	260 x 3/8 (130x2 Circuit)	330 x 3/8 (82 x 4 Circuits)	400 x 3/8 (100 x 4 Circuits)	460 x 3/8 (115 x 4 Circuits)	520 x 1 / 2 (130 x 4 Circuits)	580 x 1 / 2 (145 x 4 Circuits)	640 x 1 / 2 (160 x 4 Circuits)	700 x 1 / 2 (175 x 4 Circuits)
TXV (Alco Make)	-	R134a - TIE-MW (Orifice 003)	R134a -TIE-MW (Orifice 003)	-	-	-	-	-	-	-
	R22-TIE-HW (Orifice 001)	R22- TIE-HW (Orifice 002)	R22- TIE-HW (Orifice 003)	R22- TIE-HW (Orifice 003)	R22-TIE-HW (Orifice 003)	R22- TIE-HW (Orifice 003)	R22- TIE-HW (Orifice 004)	R22- TIE-HW (Orifice 004)	R22- TIE-HW (Orifice 004)	R22- TIE-HW (Orifice 005)
	R404A-TIE-SW (Orifice 002)	R404A-TIE-SW (Orifice 003)	R404A- TIE-SW (Orifice 003)	R404A- TIE-SW (Orifice 004)	R404A- TIE-SW (Orifice 004)	-	-	-	-	-



Dixell Controller Model - IC110CX  
(Suitable for all above compressor models)

#Rating Conditions - Evaporating Temp. = 4.4 °C, Condensing Temp. = 54.4 °C

Sub cooling=8.3K , Return Gas Temp.=35 °C

\* Water Inlet Temperature: 15 °C

Water Outlet Temperature: 10 °C



## Cold Room

(+ 4°C Room Temperature)

R134a Models	KCM511CAL	KCM511CAL	KCM514CAL	KCM522CAL	-	-	-
R22 Models	KCJ513HAE	CR22K6M	CR30K6M	CR36K6M	CR42K6M	CR53KQM	CR62KQM
R404A Models	KCJ484CAL	KCM511CAL	KCM514CAL	KCM519CAL	KCM522CAL	-	-
App. Room Size* (Ft)	10 x 6 x 8	10 x 10 x 8	12 x 12 x 8	18 x 12 x 8	18 x 16 x 8	20 x 20 x 8	20 x 32 x 8
Condenser Size (inch) (Length x Height) 3/8"O.D. Tube 6-11FPI	20 x 16 x 3 ROWS	22 x 18 x 3 ROWS	22 x 20 x 3 ROWS	22 x 20 x 4 ROWS	24 x 22 x 4 ROWS	26 x 24 x 4 ROWS	28 x 26 x 4 ROWS
Condenser Fan	14"DIA, 1,300 RPM	14"DIA, 1,300 RPM	14"DIA, 1,300 RPM	15"DIA, 1,400 RPM	15"DIA, 1,400 RPM X 2 NO.	16"DIA, 1,400 RPM X 2 NO.	15"DIA, 1,800 RPM X 2 NO.
Evaporator Size (inch) (Length x Height) 3/8"O.D. Tube 6-8FPI	22 x 16 x 4 ROWS	22 x 20 x 4 ROWS	24 x 22 x 4 ROWS	26 x 24 x 4 ROWS	28 x 26 x 4 ROWS	30 x 28 x 4 ROWS	32 x 29 x 4 ROWS
Evaporator Airflow Qty.	1,150 CFM	1,450 CFM	1,750 CFM	2,000 CFM	2,300 CFM	2,600 CFM	2,900 CFM
TXV (Alco Make)	R134a-TIE-MW (Orifice 001)	R134a-TIE-MW (Orifice 001)	R134a-TIE-MW (Orifice 002)	R134a-TIE-MW (Orifice 003)	-	-	-
	R22-TIE-HW (Orifice 001)	R22-TIE-HW (Orifice 001)	R22-TIE-HW (Orifice 002)	R22-TIE-HW (Orifice 002)	R22-TIE-HW (Orifice 003)	R22-TIE-HW (Orifice 004)	R22-TIE-HW (Orifice 004)
	R404A-TIE-SW (Orifice 002)	R404A-TIE-SW (Orifice 002)	R404A-TIE-SW (Orifice 002)	R404A-TIE-SW (Orifice 003)	R404A-TIE-SW (Orifice 003)	-	-

\*These are preliminary room sizes for cold room. Please verify the product load and select suitable compressor model.



Dixell Controller Model - XLR100 COOL MATE  
(Suitable for all above compressor models)



## Pastry Cooler

R134a Models	KCE 419HAG	KCE444HAG	KCJ467HAG	KCJ498HAG
		KCJ444HAG	KCN463HAG	
R22 Models	-	KCE443HAE	KCE461HAE	KCJ511HAE
R404A Models	-	KCJ422CAL	KCJ438CAL	KCJ461CAL
Pastry Cooler Size (Ft)	2'	3'	4'	5' - 6'
Cabinet Volume(Ltrs)	110-120	240-260	300-360	450-600
Condenser Size (inch) (Length x Height) 3/8"O.D. Tube 10-12FPI	9 x 9 x 2 ROWS	13 x 12 x 2 ROW (OR) 11 x 10 x 3 ROWS	13 x 12 x 3 ROWS	14 x 14 x 4 ROWS
Condenser Fan Motor	1/83 HP x 1,350 RPM	1/36 HP x 1,350 RPM	1/20 HP x 1,350 RPM	1/20 HP x 1,350 RPM
Condenser Fan	8"DIA	10"DIA	10"DIA	12"DIA
Evaporator Size O.D Tube (inch) x Length(ft)	5/16 x 30	3/8 x 60	3/8 x 85	3/8 x (70X2 Circuit)
Capillary Tube Bore x Length	0.044" x 10 ft x 1 NO.	0.050" x 8 ft x 1NO. For KCE443HAE 0.055" x 55" x 1NO.	0.050" x 8 ft x 1 NO.	0.050" x 8 ft" x 1 NO.



Dixell Controller Model - XR64CX  
(Suitable for all above compressor models)



### Typical System Operating Parameters

Parameters	R134a		R22		R404A	
Ambient Temperature (°C)	35	43	35	43	35	43
Suction Pressure (psig) (Bar)	18 to 20 1.2 to 1.3	30 to 32 2 to 2.2	40 to 43 2.7 to 3	55 3.8	50 to 55 3.4 to 3.8	65 4.4
Discharge Pressure (psig) (Bar)	164 to 174 11 to 12	187 to 199 12.7 to 13.7	280 to 290 19 to 20	380 26	355 24	455 31
Return Gas Temperature (°C)	16	21	10 to 13	21	13 to 15	24
• Top Shell Temperature (°C)	43 to 60	49 to 71	36 to 46	50 to 56	38 to 48	52 to 58

• Shell temp. could slightly vary with different platform models like KCJ, KCN, KCE