Emerson's Next Generation FHP Compressors

Copeland™ brand products

EMERSON™

ECZ Hermetic FHP Reciprocating Compressors

Emerson Fractional Horsepower compressors are workhorses of efficiency. Over four decades of performance has seen the compressors make their mark -be it ease of application, wide range, after sales service or its reliability.

Now, in pursuit of innovation and betterment of product value, Emerson offers the **Next Generation ECZ Hermetic FHP Reciprocating Compressor**. These take forward the rich Emerson Compressor legacy and are adept in meeting the varying cooling needs of customers across industry segments.

ECZ Platform comprises of nine compressor models in the range of 0.17 HP to 0.36 HP.

Product Advantage

- Higher Cooling Capacity
- Best-In-Class Energy Efficiency
- High Product Quality and Reliability
- Compact Shape
- Dual Frequency-Motor Capability
- Mount-On Accessories

Customer Advantage

- Low Running Cost
- Opportunity To Optimize Appliance Cost
- Reliable Product

The ECZ Series Of Refrigeration Compressors - A Winner All The Way!

Emerson Climate Zenith (ECZ) Series of Reciprocating Compressors have won the CII instituted **Most Innovative Energy Saving Product** award. The ECZ series of compressors are one of the most energy efficient in the industry, delivering upto 20% higher EER as compared to the best industry model. These are suitable for low temperature commercial refrigeration applications like deep freezers and medium / high temperature applications like visi-coolers, watercoolers, display cabinets etc.


CII
Confederation of Indian Industry

15th National Award for
Excellence in Energy Management 2014

This is to certify that the product
EMERSON CLIMATE ZENITH (ECZ) SERIES OF RECIPROCATING COMPRESSORS
offered by
EMERSON CLIMATE TECHNOLOGIES (INDIA) LIMITED
Has been rated as "Most Innovative Energy Saving Product"
This is based on the feedback of participants at the National Competition for Excellence in Energy Management held on 29 & 30 October 2014 at Hyderabad

S RAGHUPATHY
Dr NAUSHAD FORBES
L S GANAPATI

MODEL NOMENCLATURE

COMPRESSOR FAMILY SERIES
ECZ PRODUCT FAMILY

CAPACITY
NUMBERS OF DIGITS IN NOMINAL COMPRESSOR COOLING CAPACITY AT 60Hz RATING CONDITIONS

CAPACITY
FIRST TWO DIGITS IN NOMINAL COMPRESSOR COOLING CAPACITY AT 60Hz RATING CONDITIONS

APPLICATION

L	LBP
C	CBP
H	HBP

REFRIGERANT

E	R-22
G	R-134a
H	R-290
L	R-404A

ECZ	4	44	H	G	-	1	1	M	-	11D0

TYPICAL ELECTRICAL CODES

CODE	50 Hz	60 Hz
1	220-230V, 1Ph	220-230V, 1Ph
2	-	230V, 1Ph
3	220-230V, 1Ph	-
4	-	115V, 1Ph
5	380-420V, 3Ph	-

MOTOR & PROTECTOR CODES

CODE	MOTOR	PROTECTOR
1	STANDARD	EXTERNAL
2	STANDARD	INTERNAL
3	MODIFIED	EXTERNAL
4	MODIFIED	INTERNAL

MOTOR CIRCUIT & ACCESSORIES SUPPLY

	RSIR	CSIR	CSCR	3PH	PSC
NO ACCESSORIES	A	E	L	T	W
PREWIRED MO	B	F	M		X
CLOSED BOX		G	N		
PARTIAL ACCESSORIES		H	P		Y
FUTURE	C,D	J,K	Q,R,S	U,V	Z

PRODUCT VARIATIONS
4 CHARACTER BILL OF MATERIAL NUMBER INDICATING CONFIGURATION

Product Specifications

Parameter		High Temperature Applications				
# PERFORMANCE SPECIFICATIONS						
Model		**ECZ421HG-13F**	**ECZ426HG-13M**	**ECZ431HG-13M**	**ECZ434HG-13M**	**ECZ444HG-13M**
Refrigerant		**R134a**	**R134a**	**R134a**	**R134a**	**R134a**
		Performance Nominals @ 50 Hz				
Capacity	Btu/hr	1760	2150	2555	3150	3700
	Watt	516	630	749	924	1083
Power	Watt	231	240	298	335	411
EER	Btu/Wh	7.61	8.96	8.57	9.4	9
	W/W	2.23	2.62	2.51	2.76	2.64
Current	Amp	1.5	1.1	1.4	1.8	2.1
		Performance Nominals @ 60Hz				
Capacity	Btu/hr	2075	2575	3050	3750	4325
	Watt	608	754	894	1099	1266
Power	Watt	275	300	368	398	480
EER	Btu/Wh	7.54	8.58	8.3	9.42	9.01
	W/W	2.21	2.51	2.43	2.76	2.64
Current	Amp	1.8	1.3	1.7	2.0	2.3
MECHANICAL SPECIFICATIONS						
Displacement	cc/rev	5.3	6	7.22	8.7	10.5
Oil Charge	cc	240	240	240	260	260
Oil Type	-	POE	POE	POE	POE	POE
Cooling Type	CFM	350	350	350	350	350
Net Weight	Kg	9.5	9.4	9.5	11.2	11.2
ELECTRICAL SPECIFICATIONS						
*Motor Circuit		CSIR	CSCR	CSCR	CSCR	CSCR
Voltage Range @50Hz		180-260	187-260	187-260	187-254	180-260
Voltage Range @60Hz		207-253	207-253	207-253	207-253	207-253
LRA	Amp @50/60Hz	11	9	10	13.5	13.5
MCC	Amp @50/60Hz	3	2	2.3	3	3.5
Start Capacitor	µfd	40-60@230	40-60@230	40-60@230	40-60@230	40-60@230
Run Capacitor	µfd	–	6@440	6@440	6@440	6@440
OLP Model		5TM734NFBYY-53	5TM734NFBYY-53	5TM734NFBYY-53	5TM739NHBYY-53	5TM743SFBYY-53
Relay Model		KARP3841	KARPN3041	KARPN3541	KARPN4241	KARPN4241

#Performance at ASRE/T Rating Conditions. *For motor circuit diagrams, please refer to page number 5

ASRE/T Rating Conditions

Rating	Ambient Temp.	Evaporating Temp.	Condensing Temp.	Sub cooled Liquid Temp.	Return gas Temp.
	°C(°F)	°C(°F)	°C(°F)	°C(°F)	°C(°F)
HBP	35(95)	7.2(45)	54.4(130)	46.1(115)	35(95)
CBP	35(95)	-6.7(20)	54.4(130)	46.1(115)	35(95)
LBP	32(90)	-23.3(-10)	54.4(130)	32(90)	32(90)

Product Specifications

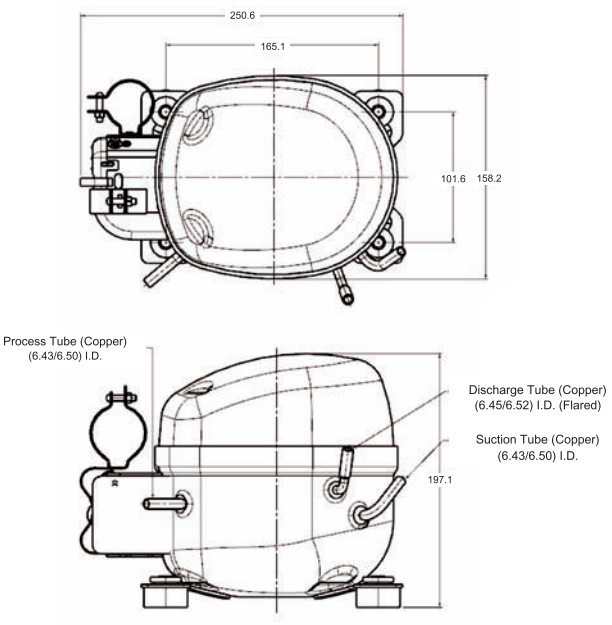
Parameter		Low Temperature Applications					
# PERFORMANCE SPECIFICATIONS							
Model		**ECZ380LG-13M**	**ECZ396LG-13M**	**ECZ411LG-13M**	**ECZ416LG-13M**	**ECZ412LL-31M**	**ECZ417LL-31M**
Refrigerant		**R134a**	**R134a**	**R134a**	**R134a**	**R404A**	**R404A**
		Performance Nominals @ 50 Hz					
Capacity	Btu/hr	660	760	915	1260	1000	1400
	Watt	193	223	268	369	293	410
Power	Watt	154	190	218	280	233	311
EER	Btu/Watt-Hr	4.28	4	4.2	4.5	4.3	4.5
	W/W	1.25	1.17	1.23	1.32	1.26	1.32
Current	Amp	0.8	0.8	1.3	1.3	1.4	1.6
		Performance Nominals @ 60Hz					
Capacity	Btu/hr	790	890	–	–	–	–
	Watt	231	261	–	–	–	–
Power	Watt	183	228	–	–	–	–
EER	Btu/Watt-Hr	4.31	3.9	–	–	–	–
	W/W	1.26	1.14	–	–	–	–
Current	Amp	0.9	1	–	–	–	–
MECHANICAL SPECIFICATIONS							
Displacement	cc/rev	7.22	8.21	10.5	13.8	6	8.7
Oil Charge	cc	240	240	300	300	240	300
Oil Type	-	POE	POE	POE	POE	POE	POE
Cooling Type	CFM	350	350	350	350	350	350
Net Weight	Kg	9.5	9.8	11.2	11.7	9.8	11.7
ELECTRICAL SPECIFICATIONS							
*Motor Circuit		CSCR	CSCR	CSCR	CSCR	CSCR	CSCR
Voltage Range @50Hz	Volts	180-260	187-260	180-260	187-260	187-260	187-260
Voltage Range @60Hz	Volts	207-253	207-253	–	–	–	–
LRA	Amp @50/60Hz	10	15	13.5	16.3	11	17
MCC	Amp @50/60Hz	2.2	2.3	3.5	3.35	2.5	3.35
Start Capacitor	µfd	40-60@230	40-60@230	40-60@230	80-100@230	40-60@230	80-100@230
Run Capacitor	µfd	6@440	10@440	6@440	10@440	10@440	10@440
OLP Model		5TM734NFBYY-53	5TM739NHBYY-53	5TM743SFBYY-53	5TM743PFBYY-53	5TM734NFBYY-53	5TM757JFBYY-53
Relay Model		PTC-8EA19D7	KARPN3741	KARPN4241	KARPN4341	KARPN3741	KARPN4441

#Performance at ASRE/T Rating Conditions. *For motor circuit diagrams, please refer to page number 5

Notes :

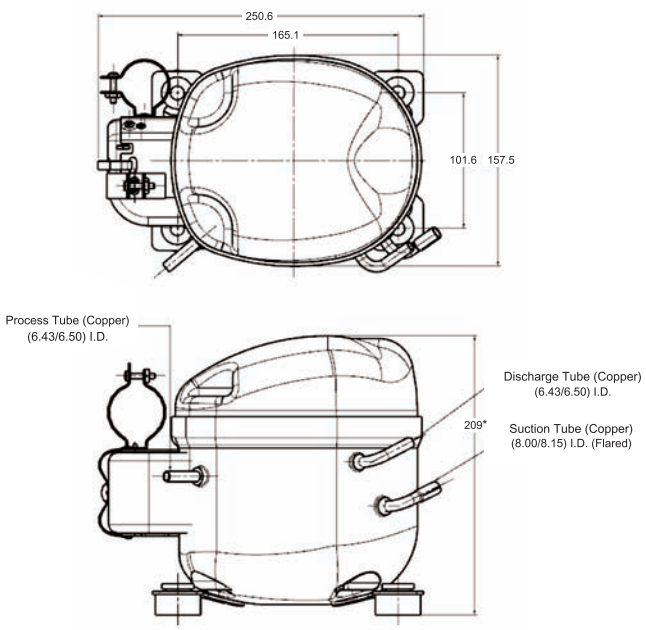
1 Electrical rating is 230V, 50Hz and 230V, 60Hz for single phase models.
2 Operating voltage range signifies the range of voltage for which the compressor can start and run upto 60°C Condensing Temperature.
3 Cooling capacity and power consumption are nominal values at specified rating conditions and subject to ±5% variation.
4 Direct air flow on glass terminal cover should be avoided.
5 Compressors with CSIR, CSCR circuit and three phase models may be used with thermostatic expansion valve.
6 Compressors with RSIR Circuit must use capillary tube only.
7 All compressors use two pole motors.
8 Compressors for specific applications are rated for IS-10617 Part I and Part III -1983
9 All run capacitor should have a rating of 440 VAC and start capacitor 275 VAC surge, unless otherwise specified by Emerson.

Dimensional Drawing



Applicable for models ECZ380, ECZ396, ECZ421, ECZ426, ECZ431, ECZ412

Note : Use of M6 bolts is recommended for compressor mounting. All dimensions in mm



Applicable for models ECZ411, ECZ416, ECZ417, ECZ434, ECZ444

*Height is 215.5mm for ECZ416 & ECZ417

ECZ Model Standard Bill Of Material

COMPRESSOR MODELS
ECZ421HG - 13F
ECZ426HG -13M
ECZ431HG -13M
ECZ434HG -13M
ECZ444HG -13M
*ECZ380LG - 13M
ECZ396LG -13M
*ECZ411LG -13M
*ECZ416LG -13M
#ECZ412LL -31M
#ECZ417LL -31M

MOUNTING CONFIGURATION								
MOUNTING CD (In Inches)	DETAILS	1	2	3	4	5	6	7
	7.5 X 7.5 (SQUARE MOUNT)							
	4.8 X 8.0 (RECTANGULAR MOUNT)							
	4.0 X 6.5 & 2.75 x 6.69 (DUAL RECTANGULAR MOUNT)			✓				
	6.12 X 8.0 (TRIANGULAR MOUNT)							
	8.44 X 9.75 (TRIANGULAR MOUNT)							
	6.53 X 8.68 (TRIANGULAR MOUNT)							

TUBING CONFIGURATION										
	W/O HEATER	0	1	2	3	4	5	6	7	8	9
	WITH HEATER	A	B	C	D	E	F	G	H	J	K
SUCTION	SIDE TUBE VERTICAL				✓					✓	
SUCTION	SIDE TUBE INCLINED			✓					✓		
SUCTION	SIDE TUBE HORIZONTAL		✓					✓			
SUCTION	TOP TUBE HORIZONTAL	✓					✓				
SUCTION	SPUD					✓					✓
DISCHARGE	TUBE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
DISCHARGE	SPUD										
PROCESS	TUBE VERTICAL	✓	✓	✓	✓	✓					
PROCESS	TUBE HORIZONTAL						✓	✓	✓	✓	✓

*FoW version also available
#FoW models

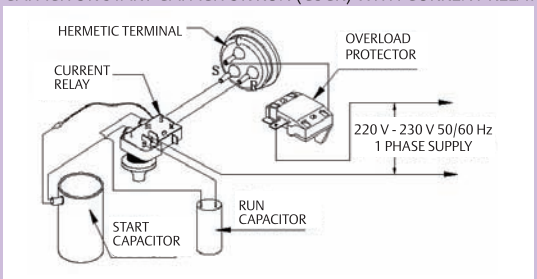
SUPPLY INDICATOR	
CODE	DETAILS
D	DOMESTIC
E	EXPORT
X	OTHER DIGITS TO BE ASSIGNED FOR CUSTOMER SPECIFIC REQUIREMENTS

APPROVAL INDICATOR	
CODE	DETAILS
0	NO APPROVALS
1	UL/CB + OTHER IF ANY
2	OTHER APPROVALS W/O UL/CB
3	CCC
*F	IP24

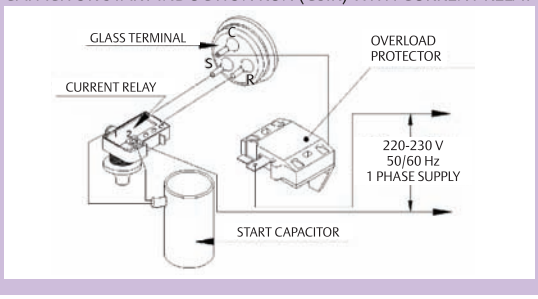
*Models with F code are specific to Freezer on Wheels

Wiring Diagram

CAPACITOR START CAPACITOR RUN (CSCR) WITH CURRENT RELAY

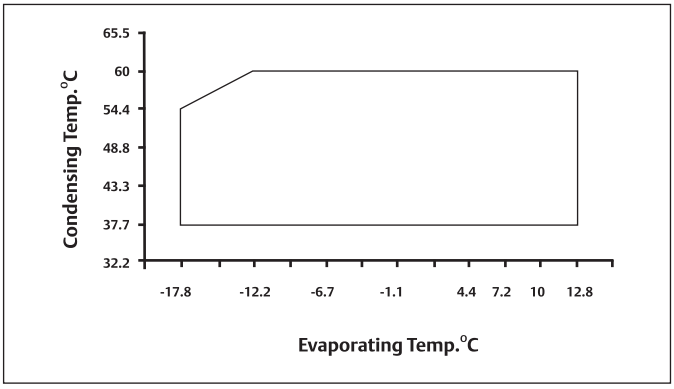


CAPACITOR START INDUCTION RUN (CSIR) WITH CURRENT RELAY

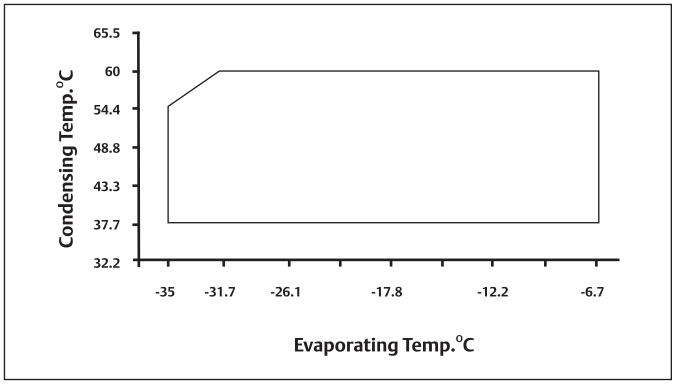


Operating Envelopes

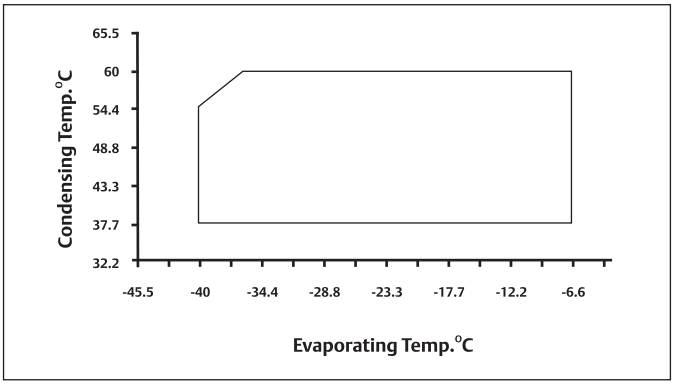
For ECZ421HG-13F-37XX, ECZ426HG-13M-37XX
ECZ431HG-13M-37XX, ECZ434HG-13M-37XX,
& ECZ444HG-13M-37XX



ECZ380LG-13M-37XX, ECZ396LG-13M-37XX,
ECZ411LG-13M-37XX & ECZ416LG-13M-37XX



ECZ412LL-31M-37XF
ECZ417LL-31M-37XF



Certifications

Model	CB	RoHS Compliance
ECZ421HG-13F	-	✓
ECZ426HG-13M	✓	✓
ECZ431HG-13M	✓	✓
ECZ434HG-13M	✓	✓
ECZ444HG-13M	✓	✓
*ECZ380LG -13M	✓	✓
ECZ396LG-13M	✓	✓
*ECZ411LG-13M	-	✓
*ECZ416LG-13M	-	✓
*ECZ412LL -31M	-	✓
*ECZ417LL -31M	-	✓

*FoW specific models are available only with IP24 protection

Applications

Low Temperature	Medium Temperature	High Temperature
Deep Freezer, Freezer on Wheels	Bottle-Cooler	Water-Cooler
Ice Cube Machine	Visi-Cooler	Oil Coolers / Panel Cooler
Laboratory Appliance	Display Cabinet Pastry Cabinet Softy Icecream	Refrigerated Air Dryer

Model Selection Guideline

Model	Water-Cooler Capacity (Ltr./Hr.)	Bottle-Cooler Capacity (Ltr.)	Visi-Cooler Case	Deep Freezer (Hard Top/Glass Top)	Freezer on Wheels
ECZ421HG-13F	20LPH	100-120 Ltr.	2 (110 Ltr.)	-	-
ECZ426HG-13M	-	150-200 Ltr.	4 (150 Ltr.)	-	-
ECZ431HG-13M	-	220-250 Ltr.	7 (250 Ltr.)	-	-
ECZ434HG-13M	-			-	-
ECZ444HG-13M	40LPH	260-310 Ltr.	9 (400 Ltr.)	-	-
ECZ380LG-13M	-	-	-	300 Ltr. /200 Ltr.	110 Ltr.
ECZ396LG-13M	-	-	-	350 Ltr. /300 Ltr.	-
ECZ411LG-13M	-	-	-	400 Ltr. /350 Ltr.	165 Ltr.
ECZ416LG-13M	-	-	-	500 Ltr. /400 Ltr.	250 Ltr.
ECZ412LL - 31M	-	-	-	-	100-110 Ltr.
ECZ417LL - 31M	-	-	-	-	165-200 Ltr.

Note: These are preliminary guidelines. The actual compressor selection may differ from guidelines. Please check the system details before selecting the compressor model.

Disclaimer

Technical data given was correct at the time of printing. Updates may occur, and should you need confirmation of a specific value, please contact Emerson stating clearly the information required. Emerson cannot be held responsible for errors in capacities, dimensions, etc., stated herein. Products, specifications and data in this literature are subject to change without notice. The information given herein is based on data and tests which Emerson believes to be reliable and which are in accordance with today's technical knowledge. It is intended for use by persons having the appropriate technical knowledge and skill, at their own discretion and risk. The products given here are designed and adapted for stationary applications only. For transport applications, please consult with your Emerson representative.

Note

The components listed in this catalogue are not released for use with caustic, poisonous or flammable substances. Emerson cannot be held responsible for any damage caused by using these substances.

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