

**HERMETIC  
COMPRESSORS**

 **Embraco**



**Embrital**  
compressor solutions

## GENERAL INFORMATION

The compressor must not be subjected to high voltage starting tests under vacuum conditions. All Embraco compressors have already been submitted to a 1650V high voltage test for one second.

The compressors must not be tested unless they are connected to the refrigeration system.

The system to which the compressor will be assembled must be developed and adequately prepared for use with HFC 134a and ester oil, i.e. with low moisture indexes and without alkaline residues and chlorides.

In the "EMI", "FFI", and "EG" series, the use of the process connector as suction line will cause a drop in capacity, the extent of which depends on the compressor size.

Desiccants similar to the XH7 or XH9 (3Å) types are recommended.

Due to the sensitivity of the HFC 134a ester oil systems we would like to make the following recommendations:

- only one system should be connected to each vacuum pump;
- draw vacuum on both sides of appliance, with vacuum level below 0.6 mbar;
- vacuum pumps must be installed on the same level as the compressor or lower;
- use short hoses wherever possible;
- vacuum level should be measured on the appliance and not on the pump;
- draw final vacuum through charging board;
- perform rough leak detection through charging board. In case of leak, the compressor should not be charged;
- limit content of non-condensable gases to 1%;
- use HFC 134a as flushing agent to clean systems;
- gas charging and evacuating equipment must be used exclusively with HFC 134a to avoid chlorinated residue contamination.

## OPERATING CONDITIONS

### Starting and Operating Voltage

Embraco compressors start at 90% of the nominal voltage, with equalized pressures of up to 8.0 kgf/cm<sup>2</sup>. Depending on the application conditions and systems characteristics, compressor may work under lower voltage as shown in the table below.

OPERATING VOLTAGE RANGES			
115V 60Hz	220-240V 50Hz	100V 50/60Hz	220V 50Hz 220V 60Hz 220V 50/60Hz
103 to 127	198 to 255	85 to 110	187 to 242

### Winding Temperature

The winding temperature should not exceed 130°C during continuous operation. To evaluate the winding temperature, we recommend the "Ohmic Resistance Measurement Method".

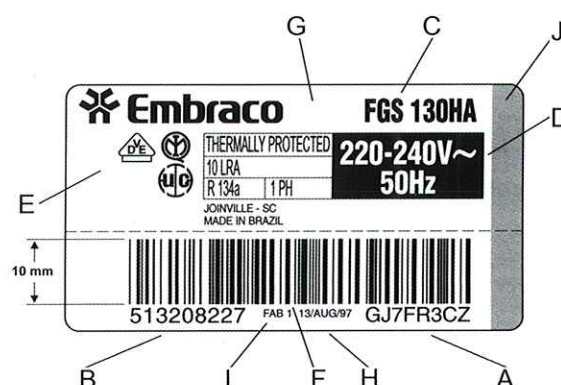
### Condensing Pressure Limit

When operating under maximum ambient temperature conditions (43°C), the condensing pressure, in continuous operation, must not exceed 16.2 kgf/cm<sup>2</sup> (230 psig) and the peak condensing pressure must not exceed 20.6 kgf/cm<sup>2</sup> gauge (293 psig).

## START CAPACITOR

The compressors EM HNR, EMI HER and EM HHR can operate without starting capacitor. However, in those cases when electrical supply problems or not equalized pressures occur at the compressor start, a starting capacitor can be applied. In this case eliminate the electrical bridge between terminals 3 and 4, and connect the starting capacitor between these terminals. Same for F and EG series, however starting capacitor shall be connected between terminals 11 and 13.

## IDENTIFICATION LABEL



- A - Serial number for traceability.
- B - Part number.
- C - Model designation.
- D - Maximum input current – LRA/Refrigerant - R 134a  
Number of phases - 1 PH/Compressor Main Voltage - VAC/V~  
(Voltage indication: 220V black/115V white background).
- E - Logos indicate the compressor Certification/Approvals.
- F - Bar code 39 (ratio 3:1 and 6.5 mils).
- G - Paper: White/Print: Black - Dimensions: 70x38 mm.
- H - Manufacturing date.
- I - Manufacturing plant.
- J - Orange border will only appear on 220V labels.

## TEST CONDITIONS

TEMPERATURE	LBP CHECK POINT ASHRAE CONDITION	HBP CHECK POINT ASHRAE CONDITION
EVAPORATING TEMP.	-23.3°C	+7.2°C
CONDENSING TEMP.	+54.4°C	+54.4°C
LIQUID TEMP.	+32.2°C	+32.2°C
AMBIENT TEMP.	+32.2°C	+32.2°C
GAS SUCTION TEMP.	+32.2°C	+32.2°C

## SERIE EM - R290

MODEL DESIGNATION	VOLTAGE/ FREQUENCY V/Hz	DISPLACEMENT cm <sup>3</sup>	CAPACITY / EVAPORATING TEMPERATURE - ASHRAE														STARTING DEVICE
			-30°C	-25°C	CHECK POINT -23.3°C		-20°C	-15°C	-10°C	-5°C	0°C	+5°C	CHECK POINT +7.2°C		+10°C	+15°C	
			W	W	CAP W	EER W/W	W	W	W	W	W	W	CAP W	EER W/W	W	W	
EMI50UER 50-60Hz	220-240V 50Hz 220V 60Hz	3.00	91	118	127	1.28	147	178	212	248	-	-	-	-	-	-	Relay
			103	138	153	1.33	181	231	290	355	-	-	-	-	-	-	
EMI70UER 50-60Hz	220-240V 50Hz 220V 60Hz	4.1	120	159	177	1.18	208	266	332	407	-	-	-	-	-	-	Relay
			142	190	210	1.30	248	317	396	485	-	-	-	-	-	-	
EMI90UEX	220-240V 50Hz	5.0	184	213	229	1.28	230	261	334	474	-	-	-	-	-	-	Relay

## SERIE F - R290

MODEL DESIGNATION	VOLTAGE/ FREQUENCY V/Hz	DISPLACEMENT cm <sup>3</sup>	CAPACITY / EVAPORATING TEMPERATURE - ASHRAE														STARTING DEVICE
			-30°C	-25°C	CHECK POINT -23.3°C		-20°C	-15°C	-10°C	-5°C	0°C	+5°C	CHECK POINT +7.2°C		+10°C	+15°C	
			W	W	CAP W	EER W/W	W	W	W	W	W	W	CAP W	EER W/W	W	W	
FFU130UAX 50-60Hz	220-240V 50Hz 220V 60Hz	6.76	224	286	319	1.49	366	463	577	707	-	-	-	-	-	-	Relay
			295	367	399	1.55	451	552	675	824	-	-	-	-	-	-	
FFU160UAX	220-240V 50Hz	7.95	297	375	399	1.45	464	567	688	830	-	-	-	-	-	-	Relay

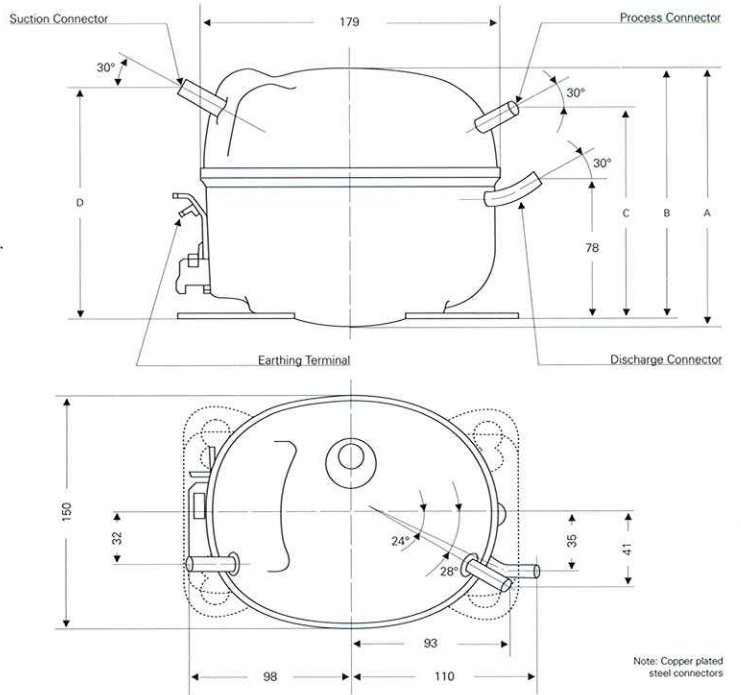
## COMPRESSORI INVERTER - R134a

MODEL DESIGNATION	VOLTAGE/ FREQUENCY V/Hz	DISPLACEMENT cm <sup>3</sup>	CAPACITY / EVAPORATING TEMPERATURE - ASHRAE														STARTING DEVICE
			-30°C	-25°C	CHECK POINT -23.3°C		-20°C	-15°C	-10°C	-5°C	0°C	+5°C	CHECK POINT +7.2°C		+10°C	+15°C	
			W	W	CAP W	EER W/W	W	W	W	W	W	W	CAP W	EER W/W	W	W	
VEMY6HH 230V 53-150Hz	1600 4500	5.72	61	86	97	1.65	118	156	202	255	-	-	-	-	-	-	INVERTER
			153	208	230	1.62	273	348	433	528	-	-	-	-	-	-	
VEGT8HB 230V 53-150Hz	1800 4500	7.95	86	121	136	1.71	165	218	283	360	-	-	-	-	-	-	INVERTER
			227	309	341	1.65	406	520	653	805	-	-	-	-	-	-	
VEGT11HB 230V 60-150Hz	1800 4500	10.61	104	150	192	1.72	204	272	358	465	-	-	-	-	-	-	INVERTER
			269	385	433	1.58	530	697	881	1073	-	-	-	-	-	-	



## SERIE EM - R134a

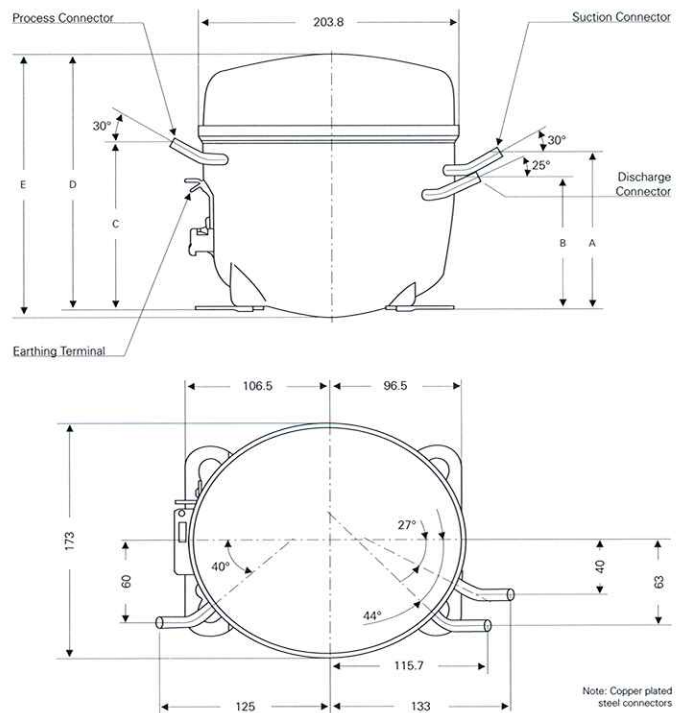
### DIMENSIONS (mm)



COMPRESSOR MODEL	A	B	C	D
EM 20/30/40 HNP - EM 20/30 HHR	157	155	139	144
EM 50/60 HNP - EM 45/55/65 HHR	168	166	150	155

## SERIE F/EGAS - R134a

### DIMENSIONS (mm)



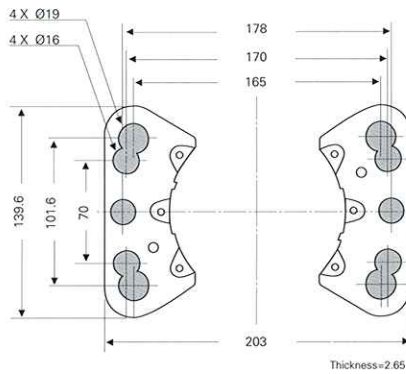
COMPRESSOR MODEL	A	B	C	D	E
FFI 6/7.5 HAK - FF 6/7.5/8.5 HBK EGAS 70/80/90	118	94	126	195	201
FFI 8.5/10 HAK - FF 10HBK FFI 12HBK - FFI 12HBX EGAS 100	124	100	132	201	207



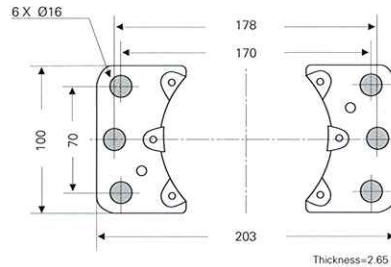
# SERIE EM - R134a

MODEL DESIGNATION	VOLTAGE/ FREQUENCY V/Hz	DISPLACEMENT cm <sup>3</sup>	CAPACITY / EVAPORATING TEMPERATURE - ASHRAE													STARTING DEVICE		
			-30°C	-25°C	CHECK POINT -23.3°C		-20°C	-15°C	-10°C	-5°C	0°C	+5°C	CHECK POINT +7.2°C		+10°C		+15°C	
			W	W	CAP W	EER W/W	W	W	W	W	W	W	CAP W	EER W/W	W		W	
EM 30HNP	220-240V 50Hz	3.00	36	55	62	0.92	79	107	141	-	-	-	-	-	-	-	-	PTC
EM 40HNP	220-240V 50Hz	3.77	52	78	88	1.08	109	147	191	-	-	-	-	-	-	-	-	PTC
EM 50HNP	220-240V 50Hz	4.99	74	107	125	1.13	146	194	251	-	-	-	-	-	-	-	-	PTC
EM 60HNP	220-240V 50Hz	5.54	88	127	142	1.15	175	230	295	-	-	-	-	-	-	-	-	PTC
EM 30HHR 50-60Hz	220-240V 50Hz	3.00	49	71	76	0.88	96	127	164	206	256	312	343	2.45	377	450	Relay	
	220V 60Hz		57	85	91	1.01	117	153	196	246	306	376	404	2.53	458	554		
EM 30HHR	115V 60Hz	3.00	58	85	91	0.94	116	154	197	249	309	379	407	2.50	460	553	Relay	
EM 45HHR	220-240V 50Hz	3.77	61	85	102	1.03	116	154	200	255	320	396	440	2.63	484	585	Relay	
EMI 45HER	115-127V 60Hz	3.77	74	109	123	1.26	150	196	248	-	-	-	-	-	-	-	Relay	
EM 55HHR 50-60Hz	220-240V 50Hz	4.60	-	-	-	-	-	-	-	326	399	485	533	2.69	583	694	Relay	
	220V 60Hz		-	-	-	-	-	-	-	-	377	471	579	630	2.60	701		837
EM 55HHR	115V 60Hz	4.60	-	-	-	-	-	-	-	365	454	560	630	2.52	681	819	Relay	
EM 65HHR	220-240V 50Hz	5.54	-	-	-	-	-	-	-	405	475	567	639	2.61	681	818	Relay	
EM 65HHR 50-60Hz	220V 50Hz	5.54	-	-	-	-	-	-	304	388	484	592	645	2.39	711	842	Relay	
	220V 60Hz		-	-	-	-	-	-	-	381	473	581	705	766	2.49	845		1001
EM 65HHR	115V 60Hz	5.54	-	-	-	-	-	-	358	447	554	680	762	2.50	824	986	Relay	

## EM BASE PLATE (mm)

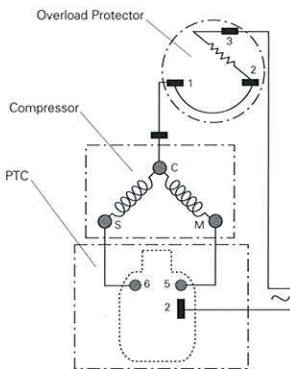


UNIVERSAL type

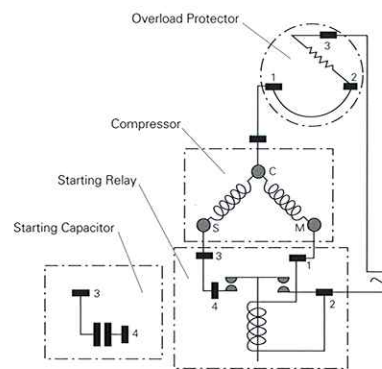


EUROPEAN type

## ELECTRICAL DIAGRAMS



EM HNP Compressors

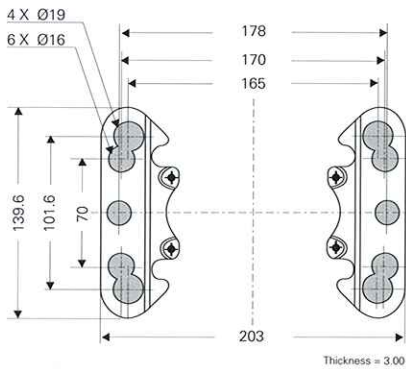


EM HHR Compressors

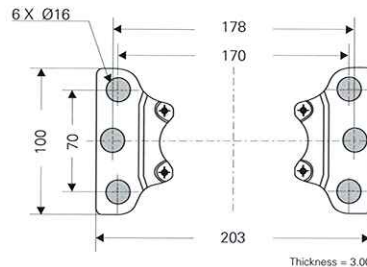
# SERIE F/EG - R134a

MODEL DESIGNATION	VOLTAGE/ FREQUENCY V/Hz	DISPLACEMENT cm <sup>3</sup>	CAPACITY / EVAPORATING TEMPERATURE - ASHRAE														STARTING DEVICE
			-30°C	-25°C	CHECK POINT -23.3°C		-20°C	-15°C	-10°C	-5°C	0°C	+5°C	CHECK POINT +7.2°C		+10°C	+15°C	
			W	W	CAP W	EER W/W	W	W	W	W	W	W	CAP W	EER W/W	W	W	
EGAS70HLR 50-60Hz	220-240V 50Hz	5.56	101	145	164	1.47	200	264	336	-	-	-	-	-	-	-	Relay
	220V 60Hz		125	180	204	1.58	249	328	417	-	-	-	-	-	-	-	
EGAS70HLR	115-127V 60Hz	5.56	125	180	204	1.58	249	328	417	-	-	-	-	-	-	-	Relay
EGAS80HLR 50-60Hz	220-240V 50Hz	6.36	123	174	195	1.52	235	306	390	-	-	-	-	-	-	-	Relay
	220V 60Hz		151	215	240	1.61	289	377	482	-	-	-	-	-	-	-	
EGAS80HLR	115-127V 60Hz	6.36	151	215	240	1.55	289	377	482	-	-	-	-	-	-	-	Relay
EGAS90HLR 50-60Hz	220-240V 50Hz	7.15	143	197	219	1.50	260	335	424	-	-	-	-	-	-	-	Relay
	220V 60Hz		175	243	271	1.59	320	413	524	-	-	-	-	-	-	-	
EGAS90HLR	115-127V 60Hz	7.15	175	243	275	1.59	320	413	524	-	-	-	-	-	-	-	Relay
EGAS100HLR 50-60Hz	220-240V 50Hz	7.95	162	225	251	1.52	298	383	483	-	-	-	-	-	-	-	Relay
	220V 60Hz		200	277	308	1.60	366	470	593	-	-	-	-	-	-	-	
EGAS100HLR	115-127V 60Hz	7.95	200	277	308	1.58	366	470	593	-	-	-	-	-	-	-	Relay
FFI 8.5HAK 50-60Hz	220-240V 50Hz	7.15	135	187	206	1.32	248	320	406	506	-	-	-	-	-	-	Relay
	220V 60Hz		157	219	241	1.37	294	384	491	618	-	-	-	-	-	-	
FFI 10HAK 50-60Hz	220-230V 50Hz	9.04	153	218	249	1.30	300	398	509	634	-	-	-	-	-	-	Relay
	220V 60Hz		186	268	302	1.42	362	470	598	749	-	-	-	-	-	-	
FFI 10HAK	115-127V 60Hz	9.04	187	268	302	1.42	362	470	598	749	-	-	-	-	-	-	Relay
FFI 12HBK	220-240V 50Hz	11.14	209	285	319	1.25	381	496	631	787	965	1164	1316	2.61	1386	1631	Relay
FFI 12HBX	220V 60Hz	11.14	221	308	349	1.18	419	554	714	901	1116	1361	1553	2.28	1637	1946	Relay
FFI 12HBX	115-127V 60Hz	11.14	218	304	349	1.20	414	552	718	913	1140	1400	1553	2.54	1694	2024	Relay

## F/EG BASE PLATE (mm)

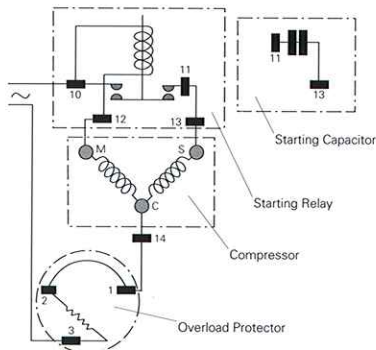


UNIVERSAL type



EUROPEAN type

## ELECTRICAL DIAGRAMS



F/EG Compressors

## TEST CONDITIONS

Condensing Temp.: 54.4°C  
Suction Gas Temp.: 32.2°C  
Liquid Subcooled: 32.2°C  
Ambient Temp.: 32.2°C

Capacity: ±5%  
Power Consumption: ±5%  
Current Consumption: ±5%  
Efficiency: ±7%

## CONVERSIONS

1 Watt: 3.41 Btu/h  
1 Watt: 0.86 Kcal/h  
1 Kcal/h: 3.97 Btu/h