

COMPRESSORS LINE

Asia Pacific Catalogue



embraco
Nidec

refrigerationclub.com



01

**ABOUT NIDEC
GLOBAL APPLIANCE**

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A global partner for home and commercial appliances industries

With over 15,000 employees across 9 countries, Nidec Global Appliance manufactures and commercializes products for home and commercial applications, including refrigeration solutions, motors for washing machines, dryers and dishwashers, as well as components for heating, ventilation and air-conditioning systems (HVAC). The division is part of Nidec Corporation, a global leader in motors and components for a wide variety of industries, with headquarters in Japan.

The business division manufactures and commercializes Embraco's cooling systems and compressors for a variety of refrigeration equipment.

embraco
Nidec

Your **global partner** in refrigeration since 1971

**Home Appliances**

Products for residential freezers, refrigerators and mini-fridges.

Commercial Appliances

Compressors and cooling solutions for commercial applications, such as bottle coolers, chest freezers, reach-ins, ice machines, medical refrigerators etc.

Aftermarket

Parts distribution, replacement and retail focused on retail owners, installers and contractors.

Since 1971, EMBRACO provides cooling solutions for home and commercial applications attending customers' most challenging demands. The portfolio brand has been counting on a broad, efficient and competitive portfolio for food service, food retail, merchandisers and special applications. A pioneer in fostering the early development of variable speed and the use of natural refrigerants in cooling solutions, Embraco continues to deliver innovation that exceeds the market's most challenging demands, anticipating trends.

DIGITAL TOOLS



embraco toolboxapp

Available in all countries and in more than 10 languages, the Embraco Toolbox App has 7 functionalities which help refrigeration professionals on their daily routine.

Download the App now for Android or iOS systems

FIND INSIDE:

- CROSS-REFERENCE
- PRODUCT CATALOGUE
- DISTRIBUTOR LOCATOR
- UNIT CONVERTER
- REFRIGERANT SLIDER
- REFRIGERATION CLUB
- TROUBLESHOOTING



PSS

PRODUCT SOFTWARE SELECTOR

Choose the best solution for your cooling system at Embraco's official portfolio platform. Access: products.embraco.com

Access: products.embraco.com



REFRIGERATION CLUB

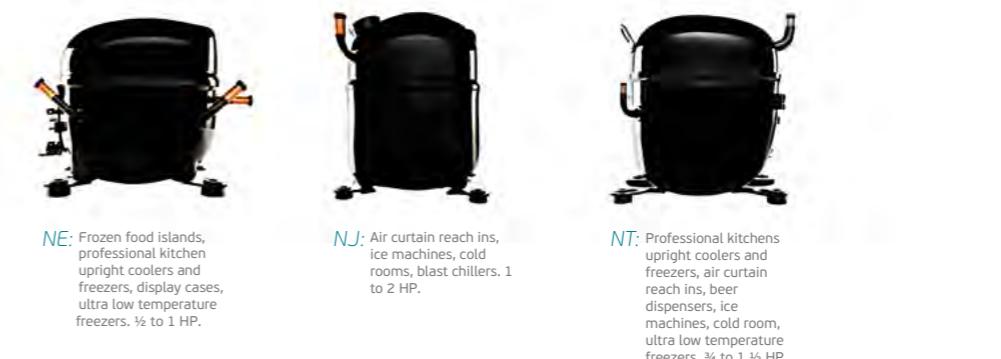
Exclusive content for refrigeration professionals in a global channel. Stay up to date and join us at: www.refrigerationclub.com

02 OUR PRODUCTS

Compressor families and their main applications



FIXED SPEED COMPRESSOR



VARIABLE SPEED COMPRESSORS



03

NOMENCLATURE

BRAZIL LINE

EM

EM|S|70|H|H|R

COMPRESSOR FAMILY
EM

PRODUCT GENERATION
 - Standard Efficiency
 I - 1^a Generation
 T - 2^a Generation
 U - 3^a Generation
 Y - 4^a Generation
 Z - 5^a Generation
 X - 6^a Generation

MECHANICAL KIT

S - Standard mechanical kit
 - Not standard

COMPRESSOR CAPACITY
 In Btu/h - 60Hz - ASHRAE
 Checkpoint divided by 10

REFRIGERANT CODE

- Blends
 C - R600a
 H - R134a
 U - R290
 L - R1234yf

EFFICIENCY LEVEL

N - Standard efficiency (LBP)
 J - Intermediate efficiency (LBP)
 E - Efficiency improved 1^a generation (LBP)
 S - Efficiency improved 2^a generation (LBP)
 H - Standard efficiency (L/M/HBP)
 D - Standard efficiency (HBP)
 B - Standard efficiency (M/HBP)
 L - Efficiency improved 2^a generation (LBP)

ELECTRICAL COMPONENT

P - PTC + cap. func. (optional)	LST
R Relay	
C - PTC + cap. func. (mandatory)	
X - Relay + cap. part. (mandatory)	HST

F

FF|U|S|1|3|0|H|A|X

COMPRESSOR FAMILY
F/EG

ELECTRICAL SYSTEM
F -

Relay/Overload protector
Start capacitor (optional)

PRODUCT GENERATION

- Standard efficiency
 I - Improved efficiency
 1st generation
 U - Improved efficiency
 2nd generation (for
 commercial refrigeration)

STANDARD PLATFORM

COMPRESSOR CAPACITY
 Approximate capacity in Btu/h - 60 Hz
 ASHRAE - Checkpoint divided by 10
 (for compressor FG, FFU and FFC)

REFRIGERANT CODE
H - R134a
U - R290
L - R1234yf

APPLICATION

A - L/MBP
B - L/M/HBP

STARTING TORQUE

K - LST (Low starting torque)
 X - HST (High starting torque)

BRAZIL VARIABLE SPEED LINE

V|E|G|T|8|H|B

TECHNOLOGY
VARIABLE
SPEED
COMPRESSORS

PRODUCT FAMILY
VEG/VEM/FMX

PRODUCT GENERATION

Y - 1st Generation
 T - 2nd Generation
 Z - 3rd Generation
 X - 4th Generation
 C - 5th Generation
 D - 6th Generation

DISPLACEMENT
cm³

REFRIGERANT CODE

H - R134a
 C - R600a
 U - R200
 L - 1234yf

EVAPORATION RANGE

B - Extended evaporation range until 23 F (L/MBP)
 - Standard evaporation range

F|M|F|T|4|1|3|U

VARIABLE SPEED

F FAMILY

EFFICIENCY LEVEL

T - Standard efficiency
 D - Top efficiency

APPLICATION AND TORQUE

1 - LBP / LST
 2 - LBP / HST
 3 - L-MBP / LST
 4 - L-MBP / HST
 5 - M-HBP / LST
 6 - M-HBP / HST

DISPLACEMENT
cm³

REFRIGERANT CODE

U - R290
 Z - R134a
 L - R1234yf
 GK - R404A

CHINA LINE

VEM / VES / FMX

V E S A | 7 | U

VARIABLE SPEED FAMILY
VES/VEM/FMX

PRODUCT GENERATION
Y - 1st Generation
T - 2nd Generation
Z - 3rd Generation
X - 4th Generation
A - 5th Generation
C - 6th Generation
D - 7th Efficiency
F - 8th Generation

DISPLACEMENT
cm³

REFRIGERANT CODE
U - R290
Z - R134a
L - R1234yf
C - R600a

EM

E M | Y | 3 | 1 | 3 | 0 | Z

COMPRESSOR FAMILY
EM/EH

PRODUCT GENERATION
□ - 1st Generation
K - 2nd Generation
U - 3rd Generation
X - 4th Generation
D - Next Generation

APPLICATION CODE
1. LBP - LST
2. LBP - HST
3. L-MBP - LST
4. L-MBP - HST
5. M-HBP - LST
6. M-HBP - HST
9. M-HBP - HST

CAPACITY
The first digit is the number of zeros
that you must attach to the last two
digits to obtain the capacity (aprox.)
in kcal/h in 50 Hz.
Ex.: 144 = 440 kcal/h em 50 Hz.

REFRIGERANT CODE
UR290
Z R134a
E R22/R422D
GK R404A
Y R600a

EUROPE LINE

EM / NE / NT / NJ

N T U | 6 | 2 | 2 | 4 | Z | V

COMPRESSOR FAMILY
NE / NT / NJ

PRODUCT GENERATION
□ - 1st Generation
K - 2nd Generation
U - 3rd Generation
X - 4th Generation
D - Next Generation

APPLICATION CODE
1. LBP - LST
2. LBP - HST
3. L-MBP - LST
4. L-MBP - HST
5. M-HBP - LST
6. M-HBP - HST
9. M-HBP - HST

CAPACITY
The first digit is the number of zeros
that you must attach to the last two
digits to obtain the capacity (aprox.)
in kcal/h in 50 Hz.
Ex.: 144 = 440 kcal/h em 50 Hz.

REFRIGERANT CODE
UR290
Z R134a
E R22/R422D
GK R404A
Y R600a

IPR VALVE - AVAILABLE FOR SOME MODELS
Available for some models

EUROPE VARIABLE SPEED LINE

V N E | U | 2 | 1 | 7 | U

TECHNOLOGY
VARIABLE
SPEED
COMPRESSORS

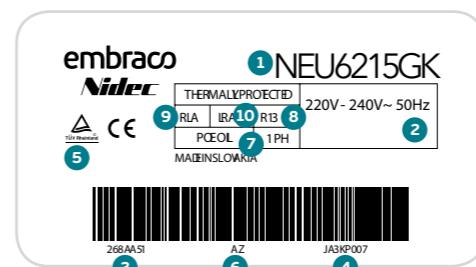
COMPRESSOR FAMILY
VNE

PRODUCT GENERATION
K - 1st Generation
U - 2nd Generation

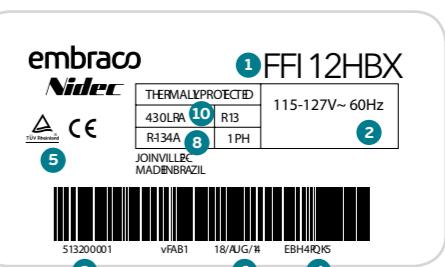
DISPLACEMENT
cm³

REFRIGERANT CODE
U - R290
Z - R134a
GK - R404A

NE / NT / NJ



EM / EG / F / VEM / VEG / VNE



LEGENDA

- | | | | |
|---|--------------------|----|--|
| 1 | Compressor model | 6 | Production Date |
| 2 | Voltage | 7 | Oil Type and Quantity |
| 3 | SKU code (BOM) | 8 | Refrigerant Code |
| 4 | Series number | 9 | Annual Consumption (nominal current,
when applicable) |
| 5 | Institute approval | 10 | Locked Rotor current (LRA, when applicable) |

04 APPLICATION GUIDE

Our products are classified into four main application groups in the light commercial refrigeration: merchandisers, supermarkets, professional kitchens and household refrigeration. Below you will find the portfolio for each application and relevant technical information.

MERCHANDISERS



SUPERMARKETS



PROFESSIONAL KITCHENS



HOUSEHOLD REFRIGERATION

MERCHANDISERS

GLASS DOOR HORIZONTAL FREEZERS



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-30 °C
INTERNAL CABINET TEMPERATURE	-18 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-70 %
APPLICATION	LBP / LST

COMPRESSORS 50Hz

Size (Liters)	R-134a (Refrigerant)	R290 (Refrigerant)
200 TO 290	EMI60HER	EM2X3113U
300 TO 360	EGAS80HLR / FFUS80HAK	EM2X3117U
380 TO 420	EGAS100HLR / FFUS100HAK	EM2X3121U
430 TO 500	FFU130HAX / FFUS130HAX	EM2X3125U
500 TO 600	FFU160HAX	EMX3134U

GLASS DOOR UPRIGHT FREEZER



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-30 °C
INTERNAL CABINET TEMPERATURE	-18 °C
AMBIENT TEMPERATURE	35 °C
RELATIVE HUMIDITY	40-75 %
APPLICATION	LBP / HST

COMPRESSOR 50Hz

Size (Liters)	R290 (Refrigerant)	R404A (Refrigerant)
200 TO 290	NEU2140U	NEU2140GK
300 TO 400	EHU2155U	NEU2155GK
400 TO 500	NEU2168U	NEU2168GK
500 TO 600	NEU2178U	NEU2178GK

UPRIGHT AIR CURTAIN COOLER



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-10 °C
INTERNAL CABINET TEMPERATURE	-5 °C
AMBIENT TEMPERATURE	25 °C
RELATIVE HUMIDITY	40-75 %
APPLICATION	MBP / LST

COMPRESSORS 50Hz

Size (Meters)	R-134a (Refrigerant)	R404A (Refrigerant)
1,5	NT6217Z	NEU6215GK
2,25	-	NT6222GK / NT6220GK

MEAT DISPLAY CASE



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-10 °C
INTERNAL CABINET TEMPERATURE	0 °C to 7 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-70 %
APPLICATION	M/HBP

COMPRESSOR 50Hz		
Size (Liters)	R-134a (Refrigerant)	R404A (Refrigerant)
1	FFI12HBX	-
2	FFU160HAX	NEU6215GK
3	NEU6214Z / NT6215Z / NE6217Z	-
4	-	NT6222GK / NT6220GK

UPRIGHT GLASS DOOR BOTTLE COOLER



SYSTEM	CHARACTERISTICS	
EVAPORATION TEMPERATURE	-10 °C	
INTERNAL CABINET TEMPERATURE	5 °C	
AMBIENT TEMPERATURE	40,5 °C	
RELATIVE HUMIDITY	40-75 %	
APPLICATION	MBP / LST	

COMPRESSOR 50Hz		
Size (Liters)	R-134a (Refrigerant)	R-290
100	EMI60HER	EM2X3113U
300	FFUS70HAK	EM2X3117U
400	FFUS100HAK	EM2X3121U
500 TO 600	FFUS130HAX	EM2X3125U
1000	FFU160HAX	EMX3134U

BAKERY DISPLAY CASE



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-10 °C to -5 °C
INTERNAL CABINET TEMPERATURE	5 °C to 12 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-70 %
APPLICATION	MBP / LST

COMPRESSOR 50Hz		
Size (Liters)	R-134a (Refrigerant)	
1	EMI60HER	
2	FFUS100HAK	
3	FFUS130HAX / FFU130HAK	

VENDING MACHINES



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-15 °C
INTERNAL CABINET TEMPERATURE	-4 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-75 %
APPLICATION	L / MBP / LST

COMPRESSOR 50Hz		
Size (Liters)	R-134a (Refrigerant)	R-290
200	EMI60HER	EM2X3113U
300	FFUS70HAK	EM2X3117U
400 TO 500	FFI10HBK	EM2X3121U
500 TO 600	FFI12HBK	EM2X3125U

SUPERMARKETS

REACH INS WITH DOORS



SYSTEM		CHARACTERISTICS
EVAPORATION TEMPERATURE		-10 °C to -5 °C
INTERNAL CABINET TEMPERATURE		0 °C to 10 °C
AMBIENT TEMPERATURE		32 °C
RELATIVE HUMIDITY		40-75 %
APPLICATION		MBP / LST

COMPRESSOR 50Hz		
Size (Liters)	R-134a (Refrigerant)	R290
350 TO 500	-	EM2X3125U
500 TO 700	NEU6212GK	EHU6214U
700 TO 900	NEU6215GK	NEU6217U
900 TO 1000	NT6222GK	NT6222U

FROZEN FOOD ISLANDS



SYSTEM		CHARACTERISTICS
EVAPORATION TEMPERATURE		-30 °C
INTERNAL CABINET TEMPERATURE		-20 °C to -15 °C
AMBIENT TEMPERATURE		32 °C
RELATIVE HUMIDITY		40-70 %
APPLICATION		LBP / LST

COMPRESSOR 50Hz			
Length (m)	R404A (Refrigerant)	R290 (Refrigerant)	VCC R290
1.5m	NEU2155GK	EHU2155U	FMFT411U
1.8m	NEU2168GK	EHU2155U	FMFT413U
2.1m	NEU2168GK	NEU2168U	FMFT413U
2.5m	NEU2178GK	NEU2178U	FMFT413U

PROFESSIONAL KITCHEN

UNDERCOUNTER AND PREP TABLE



SYSTEM		CHARACTERISTICS
EVAPORATION TEMPERATURE		-15 to -5 °C
INTERNAL CABINET TEMPERATURE		0 to 10 °C
AMBIENT TEMPERATURE		32 °C
RELATIVE HUMIDITY		40-70 %
APPLICATION		MBP

COMPRESSOR 50Hz		
Size (Liters)	R-134a (Refrigerant)	R290
<300	FFU70HAK	EM2X3113U
300 - 500	FFU570HAK	EM2X3117U
500	FFU100HAK	EM2X3121U

SYSTEM		CHARACTERISTICS
EVAPORATION TEMPERATURE		-30 °C
INTERNAL CABINET TEMPERATURE		-18 °C
AMBIENT TEMPERATURE		32 °C
RELATIVE HUMIDITY		40-70 %
APPLICATION		LBP

COMPRESSOR 50Hz			
Size (Liters)	R-134a (Refrigerant)	R404A (Refrigerant)	R290 (Refrigerant)
<120	FFUS100HAK	-	EM2X3113U
120 - 175	FFI12HBX	-	EM2X3117U
175 - 275	FFU160HAX	-	EM2X3121U
275 - 350	NEU2140Z	NEU2140GK	-
350 - 500	-	NEU2155GK / NEK2168GK	-
500 - 700	-	NEU2178GK / NT2178GK	-

REACH IN FREEZER
AND REFRIGERATOR



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-30 °C
INTERNAL CABINET TEMPERATURE	-18 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-70 %
APPLICATION	LBP

COMPRESSOR 50Hz			
Size (Liters)	R-134a (Refrigerant)	R404A (Refrigerant)	R290 (Refrigerant)
<350	FFU100HAK		EM2X3121U
350 - 550	FFI12HBX		EM2X3125U
500 - 650	FFU160HAX		EMX3134U
650 - 900		NEU2140GK	EMX3140U
900 - 1200		NEU2155GK / NEU2168GK	EHU2155U / NEU2168U
1200 - 1500		NEU2178GK	NEU2178U
1500		NT2180GK	NT2180U
		NT2212GK	NT2210U

SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-15 to -5 °C
INTERNAL CABINET TEMPERATURE	0 to 10 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-70 %
APPLICATION	MBP

COMPRESSOR 50Hz			
Size (Liters)	R-134a (Refrigerant)	R404A (Refrigerant)	R290
<350	FFU70HAK	-	EM2X3113U
350 - 550	FFU80HAK	-	EM2X3117U
500 - 650	FFU100HAK	-	EM2X3121U
650 - 900	FFI12HBX	-	EM2X3125U
900 - 1200	FFU160HAX	-	EMX3134U
1200 - 1500	NEU6215Z / NEK6214Z / NT6217Z	NEU6215GK	EMX3140U

FAST FREEZER

SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-30 °C
INTERNAL CABINET TEMPERATURE	-18 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-70 %
APPLICATION	LBP

COMPRESSOR 60Hz	
Size (Liters)	R404A
10	NEU2178GK & NT2178GK
15	NT2180GK
20	NT2192GK & NJ2192GK
25	NJ2212GK & NJ2212GS

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HOUSEHOLD APPLICATIONS

HOUSEHOLD REFRIGERATOR 1 DOOR



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-30 °C
INTERNAL CABINET TEMPERATURE	5 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-70 %
FREEZER TEMPERATURE	-18 °C
APPLICATION	LBP / LST

HOUSEHOLD REFRIGERATOR 1 DOOR		
COMPRESSOR 50Hz		
Size (Liters)	R-134a (Refrigerant)	R600a (Refrigerant)
50-100	EMIS30HHR	-
101-200	EMI45HER	EMU40CLP
201-300	EMI60HER	EMU60CLP
301-350	EMI70HER/EMIS70HHR	EMYe70CLP

HOUSEHOLD REFRIGERATOR 2 DOORS



SYSTEM	CHARACTERISTICS
EVAPORATION TEMPERATURE	-30 °C
INTERNAL CABINET TEMPERATURE	5 °C
AMBIENT TEMPERATURE	32 °C
RELATIVE HUMIDITY	40-70 %
FREEZER TEMPERATURE	-18 °C
APPLICATION	LBP / LST

HOUSEHOLD REFRIGERATOR 2 DOORS		
COMPRESSOR 50Hz		
Size (Liters)	R-134a (Refrigerant)	R600a (Refrigerant)
250 - 310	EMI60HER	EMU60CLP
311 - 370	EMI70HER/EMI70HHR	EMYe70CLP
371 - 510	EGAS80HLR	EGAS80CLP / EMU80CLP
511 - 580	FFUS100HAK / EGAS100HLR	EGAS100CLP

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05

TECHNICAL INFORMATION

MOTOR TORQUE

LOW STARTING TORQUE	
LST	Compressor with RSIR-RSCR-PSC electrical motor for systems with capillary tube and with equalized pressures at start up.
HIGH STARTING TORQUE	
HST	Compressor with CSIR-CSR and 3 phase electrical motor for systems with equalized or not equalized pressures at start up.

APPLICATIONS

		EVAPORATION TEMPERATURE °C	APPLICATIONS
LBP	LOW BACK PRESSURE	From -45/-35 and -10	Household refrigerators, frozen food islands, ice cream freezers
MBP	MEDIUM BACK PRESSURE	Between -15 and 0	Displays cases, reach in coolers, bottle coolers
HBP	HIGH BACK PRESSURE	Between 0 and 15	Refrigerated wine houses, Water coolers, air dehumidifiers

TEST CONDITIONS

TEST CONDITIONS	APPLICATIONS	EVAPORATION TEMPERATURE °C / °F	CONDENSING TEMPERATURE °C / °F	GAS RETURN TEMPERATURE °C / °F	SUBCOOLING K	AMBIENT TEMPERATURE °C / °F
ASHRAE	LBP	-23.3 / 10	54.4 / 130	32.2 / 90	22.2	32.2 / 90
	M/HBP	7.2 / 45	54.4 / 130	35 / 95	8.3	35 / 95
ARI	LBP	-23.3 / -9.94	48.9 / 120.02	4.4 / 39.92	0	35 / 95
	MBP	-6.7 / 19.94	48.9 / 120.02	4.4 / 39.92	0	35 / 95
	HBP	7.2 / 44.96	54.4 / 129.92	18.3 / 64.94	8.3	35 / 95
EN12900	LBP	-35	40	20	40	35
	MBP	-10	45	20	45	35
	HBP	5	50	20	50	35

COOLING TYPE

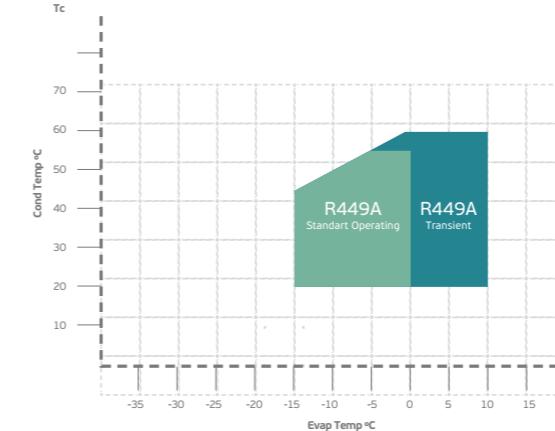
STATIC	Compressor approved for static cooling not requiring a fan motor on the condenser side.
FAN	Compressor approved for fan cooling requiring forced cooling with a fan motor on the condenser side.
STATIC/FAN (S/F)	Compressor approved for static and fan cooling which may or may not apply a fan motor on the condenser side.

BLEND APPROVED BY EMBRACO REPLACING R12

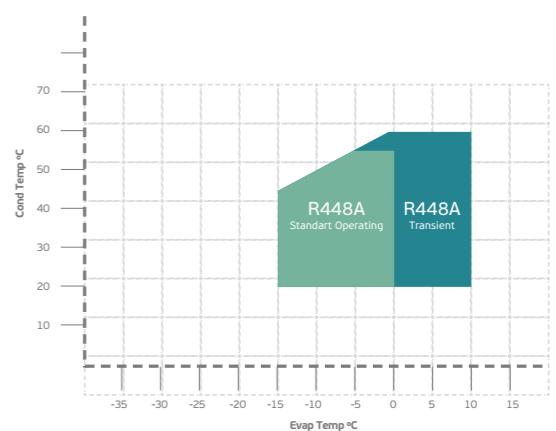
REFRIGERANTS	
ASHRAE	Nome comercial
R-401a	SUVA® MP39
R-401b	SUVA® MP66
R-409b	FORANE® FX56
R-413a	ISCEON 49

Embraco already approved R452A for NEU, NT, NJ compressor series as an alternative refrigerant for both LBP (low back pressure) and MBP (medium back pressure) applications maintaining the original R404A operating envelope. Embraco approves R449A and R448A as an alternative refrigerant for Embraco R404A compressor series NEU, NT, NJ only for MBP application with limited operating envelope as below.

MBP (R449A) - Standard Operating Envelope



MBP (R448A) - Standard Operating Envelope

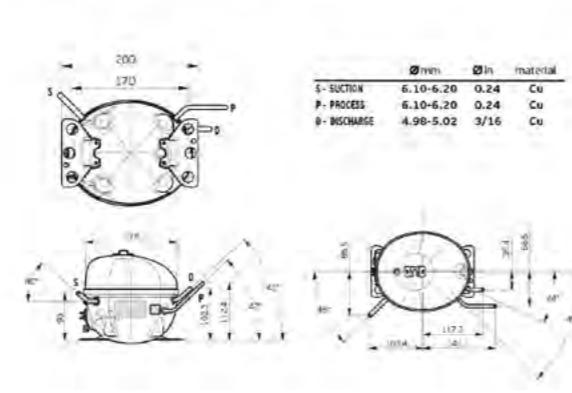
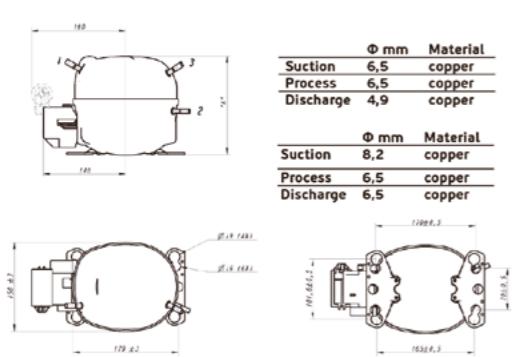


UNITS CONVERSION TABLE

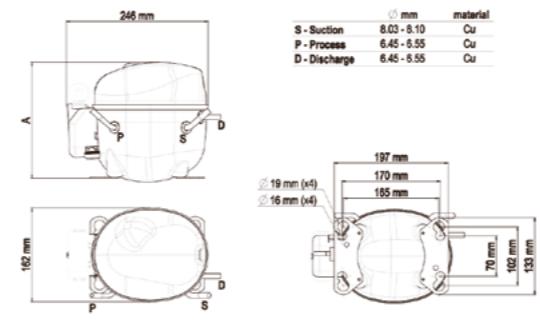
	BTU	W	kcal/h
1 BTU	-	0,293	0,252
1 W	3,412	-	0,86
1 kcal/h	3,966	1,162	-

EXTERNAL VIEWS

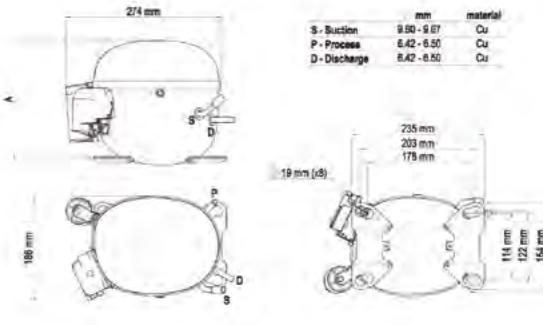
DWG 1 - EM / VEM SERIES UNIVERSAL BASE PLATE



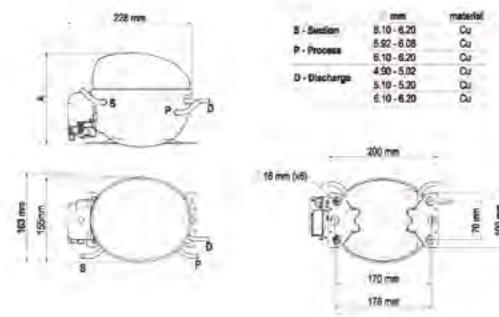
DWG 6 - NE / VNE SERIES UNIVERSAL BASE PLATE



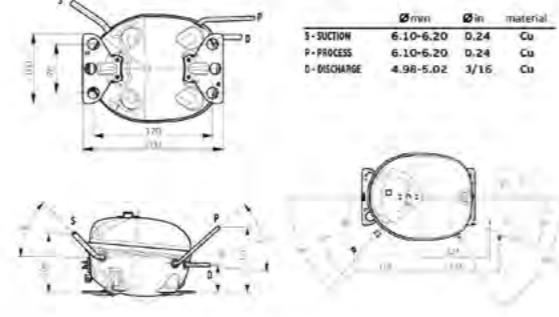
DWG 7 - NT SERIES UNIVERSAL BASE PLATE



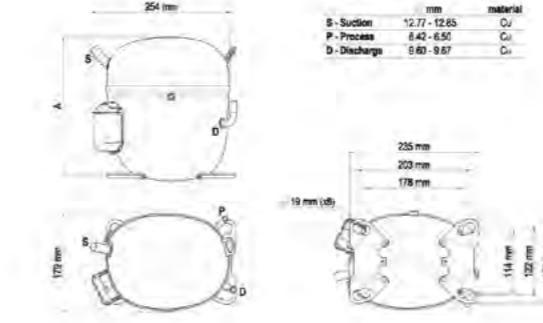
DWG 2 - EM SERIES EUROPEAN BASE PLATE



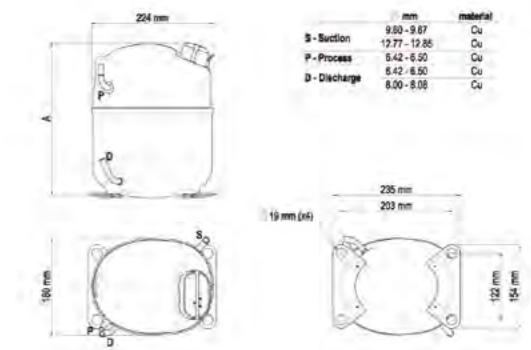
DWG 3 - VES SERIES



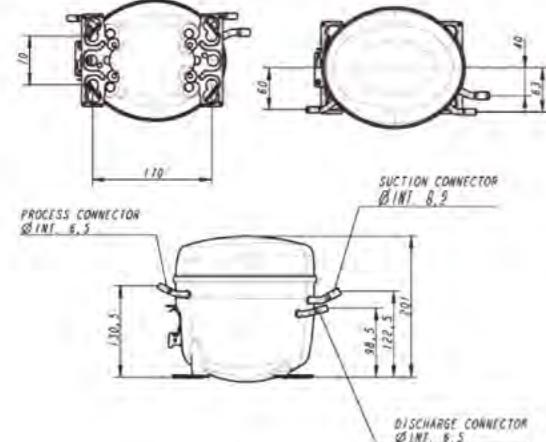
DWG 8 - NTU SERIES UNIVERSAL BASE PLATE



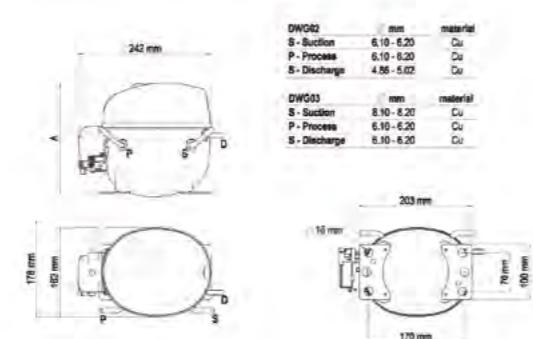
DWG 9 - NJ SERIES UNIVERSAL BASE PLATE



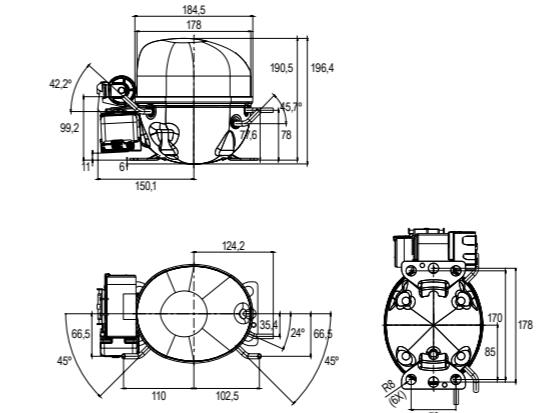
DWG 4 - EG / F / VEG SERIES UNIVERSAL BASE PLATE



DWG 5 - NB / NE SERIES EUROPEAN BASE PLATE



DWG 10 - EH SERIES



If you want to buy only the board, contact technical support.

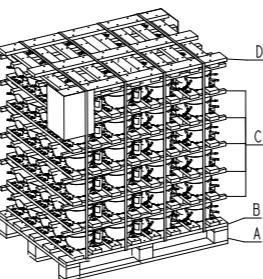
COMPRESSOR PACKAGING

MULTIPLE PACKAGING

This type of package consists of a shipping skid of 835 mm x 1150 mm on which are positioned the elements composing the packaging of various compressor layers, as listed below, secured with straps to the shipping skid

Pallet packages composition

A	SHIPPING SKID	on which the base is positioned
B	BASE	on which the first layer of compressors is positioned
C	SEPARATOR SKID	are positioned between layers, in quantities according to the compressor series
D	TOP SKID	upper element closing of the package



Characteristics of multiple wooden packaging

COMPRESSOR	QUANTITY PER PALLET (ASSEMBLED ELECTRICALS)*	QUANTITY PER CONTAINER (ASSEMBLED ELECTRICALS)*	QUANTITY PER CONTAINER (UNASSEMBLED ELECTRICALS)*	QUANTITY PER PALLET (UNASSEMBLED ELECTRICALS)*
EM	100	2500	2800	120
EG / F	72	1920	2016	80
EH	80	1760	2080	80
NE	72	1800	1800	80
NT**	36	1232	1512	44
NJ**	33	1512	1386	36
VES	120	2880	2880	120
FMX	120	2400	2880	120
VEM	100	2200	2800	100
VEG/FMF	72	1920	2016	80
VNE	72	1800	1800	80

*The data presented in this table is nominal and might be impacted by fill rate

**Consult the limit of weight for these models

SINGLE PACKAGING

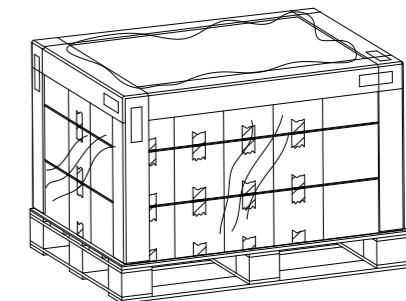
This type of package consists of a carton box and an internal separator to prevent any compressor movement. The electrical components and accessories are included in the package (assembled or attached).

Complete palet package consists of a shipping skid of 830 mm x 1130 mm on which are placed carton boxes with compressors secured with corner strip and straps. Number of layers depends on compressor families.

Carton box for single package



Single compressor palet package



Characteristics of complete single package

SERIES	QUANTITY PER PALLET	CODE	PACKAGING TYPE	ELECTRICAL COMPONENTS	NOTE
EM	70	A	5 layers of 14 compressors	ASSEMBLED	
EM	56	J	4 layers of 14 compressors	ASSEMBLED	
NE	56	A	4 layers of 14 compressors	NOT ASSEMBLED / ASSEMBLED	
NE	56	J	4 layers of 14 compressors	ASSEMBLED	
NE	44	F	4 layers of 11 compressors	NOT ASSEMBLED / ASSEMBLED	CSR electrical box included
NT	44	A	4 layers of 11 compressors	NOT ASSEMBLED / ASSEMBLED	
NT	44	F	4 layers of 11 compressors	NOT ASSEMBLED / ASSEMBLED	CSR electrical box included
NJ	33	A	3 layers of 11 compressors	NOT ASSEMBLED	
NJ	33	F	3 layers of 11 compressors	ASSEMBLED	CSR electrical box included

Wooden packaging and pallets are created to comply with recycling regulations and are treated according to standard ISPM No. 15 - Regulation of wood packaging material in international trade. IPPC mark is presented on the wooden palets.

PACKAGE FOR ELECTRICAL COMPONENTS AND ACCESSORIES

Electrical components and accessories if not assembled on compressors are packed separately in carton boxes. A label is applied showing the following data:

Components packing label

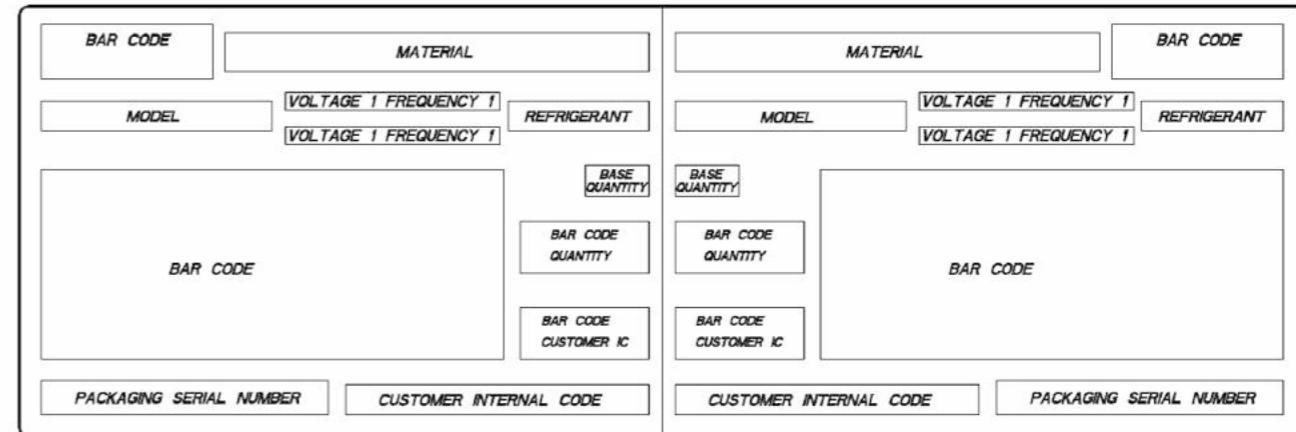
1. Components bill of material code
(complete of electrical components and accessories)
2. Compressor model
3. Quantity
4. Customer name (optional)
5. List of electrical components and accessories shipped
(code/description/quantity)

COMPRESSOR IDENTIFICATION MARKS

Labels are applied on two sides of each package and report the following data:

1. Compressor bill of material
2. Bar code of compressor bill of material (Type 39)
3. Compressor model
4. Voltage & frequency
5. Refrigerant
6. Package quantity (optional)
7. Packaging serial number
8. Bar code of packaging serial number (Type 128)

Compressor identification label for multiple packaging



Compressor identification label for single packaging



COMPRESSORS CATALOGUE

100 V 50/60 Hz

COMPRESSORS CATALOGUE

115V 60 Hz

115V 60Hz R290 M/HBP													
Model	Origin	Displacement	Voltage	Envelope	Torque	Motor	LRA	Test Condition	Frequency	Cooling Capacity (°C)			
										-20	-15	-10	-5
NEK6152U	SK	5.44	115-127 V 60 Hz	MBP	HST	CSIR	25.00	ARIMBP	60 Hz	221	279	346	422
NEU6181U	SK	7.28	115-127 V 60 Hz	MBP	HST	CSIR	30.00	ASHRAEHBP46	60 Hz	393	499	626	773
NEK6210U	SK	8.77	115-127 V 60 Hz	MBP	HST	CSIR	37.00	ARIMBP	60 Hz	363	458	570	698
NEK6213U	SK	12.11	115-127 V 60 Hz	MBP	HST	CSIR	44.00	ASHRAEHBP46	60 Hz	660	807	984	1193
NEU6214U	SK	12.11	115-127 V 60 Hz	MBP	HST	CSCR	42.00	ASHRAEHBP46	60 Hz	710	888	1094	1328
NEU6214U	SK	12.11	115-127 V 60 Hz	MBP	HST	CSIR	42.00	ASHRAEHBP46	60 Hz	708	882	1084	1313
NEX4160UA	SK	14.40	115-127 V 60 Hz	L/MBP	HST	CSCR	46.00	ARIMBP	60 Hz	696	871	1070	1294
NEU6217U	SK	14.28	115-127 V 60 Hz	MBP	HST	CSIR	29.00	ASHRAEHBP46	60 Hz	818	1019	1252	1518
NEU6217U	SK	14.28	115-127 V 60 Hz	MBP	HST	CSCR	45.00	ASHRAEHBP46	60 Hz	824	1023	1258	1528
NT6217UV	SK	14.50	115-127 V 60 Hz	MBP	HST	CSIR	44.00	ARIMBP	60 Hz	495	626	793	995
NT6217UV	SK	14.50	115-127 V 60 Hz	MBP	HST	CSCR	44.00	ARIMBP	60 Hz	498	624	801	1030
NEX4170UA	SK	16.80	115-127 V 60 Hz	L/MBP	HST	CSCR	49.50	ARIMBP	60 Hz	820	1022	1251	1508
NEX6221UA	SK	16.80	115-127 V 60 Hz	M/HBP	HST	CSCR	49.50	ARIMBP	60 Hz	831	992	1211	1488
NT6220UV	SK	17.39	115-127 V 60 Hz	MBP	HST	CSCR	54.50	ARIMBP	60 Hz	620	794	996	1224
NEX4180UA	SK	18.70	115-127 V 60 Hz	L/MBP	HST	CSCR	53.00	ARIMBP	60 Hz	924	1140	1382	1650
NT6222UV	SK	20.44	115-127 V 60 Hz	MBP	HST	CSCR	54.50	ARIMBP	60 Hz	669	913	1182	1478
NTX6222UV	SK	20.44	115-127 V 60 Hz	M/HBP	HST	CSCR	60.00	ASHRAEHBP46	60 Hz	1048	1321	1656	2503

Model	Cooling Capacity (°C)				Check Point		Lubricant		Expansion Device	Wiring Diagram
	0	5	10	15	(Evaporating 7.2°C / Condensing 54.4°C)	Capacity (W)	Efficiency (W/W)			
NEK6152U	507	602	706			862	2.44	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEU6181U	940	1127	1334			1224	2.73	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEK6210U	843	1004	1182			1369	2.48	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEK6213U	1432	1702	2002			1846	2.14	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEU6214U	1589	1879	2197			2027	2.71	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEU6214U	1571	1857	2170			1989	2.46	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEX4160UA	1541					-	-	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEU6217U	1817	2148	2512			2264	2.24	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEU6217U	1832	2172	2547			2351	2.56	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NT6217UV	1234	1512	1829			2103	2.53	450	ESTER / ISO22	Capillary Tube or Expansion Valve
NT6217UV	1314	1656	2056			2178	2.81	450	ESTER / ISO22	Capillary Tube or Expansion Valve
NEX4170UA	1791					-	-	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NEX6221UA	1823					2814	2.63	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NT6220UV	1479	1762	2071			2594	2.80	450	ESTER / ISO22	Capillary Tube or Expansion Valve
NEX4180UA	1945					-	-	350	ESTER / ISO22	Capillary Tube or Expansion Valve
NT6222UV	1799	2147	2521			3024	2.73	450	ESTER / ISO22	Capillary Tube or Expansion Valve
NTX6222UV	2513	3035	3620			3323	2.84	450	ESTER / ISO22	Capillary Tube or Expansion Valve

COMPRESSORS CATALOGUE

220V 50 Hz

COMPRESSORS CATALOGUE

220V 60 Hz

COMPRESSORS CATALOGUE

TRI-PHASE

VARIABLE SPEED COMPRESSORS

embraco
Nidec

06 VARIABLE SPEED COMPRESSORS

Embraco variable speed compressors are a solution for residential and commercial applications which demand fast cooling, low energy consumption, operate with a low starting voltage and with a wide operating range, low noise and vibration levels. The variable speed compressor associated with an inverter allows the compressor run in different RPM, delivering the cooling capacity needed according to the thermal load.

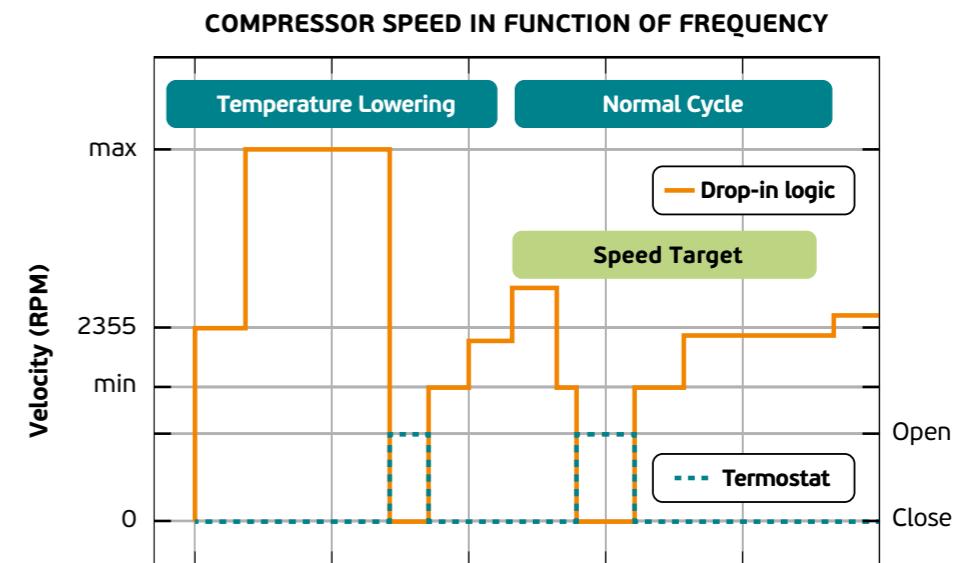
CONTROL MODES

DROP-IN

Drop-In can use all kinds of inverters, where single thermostat contact is used to set the compressor running conditions. Drop-In mode allows the application to any refrigeration system with a simple ON/OFF thermostat, without the need of a rotation control signal through serial or frequency communication. The compressor speed will be adjusted automatically by the inverter, in accordance to the thermal load variation.

SMART DROP-IN

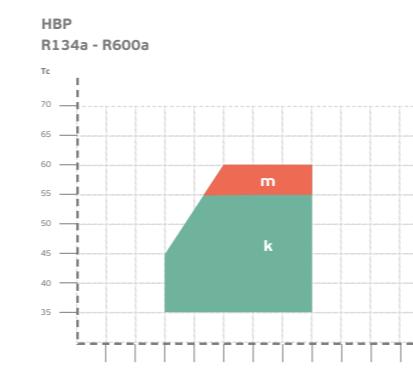
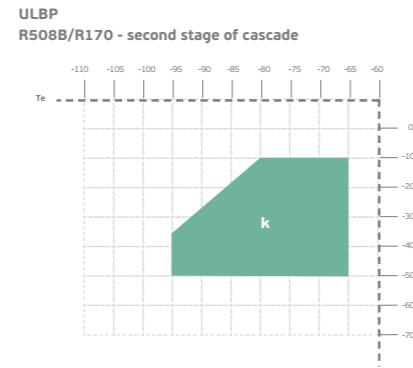
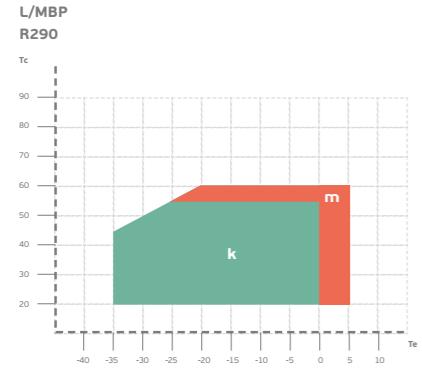
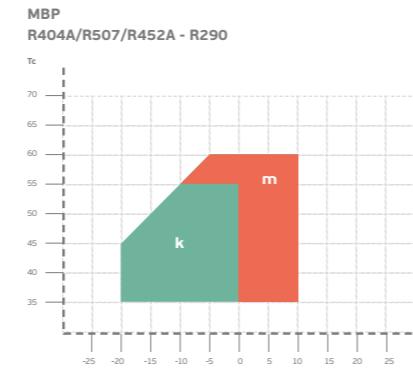
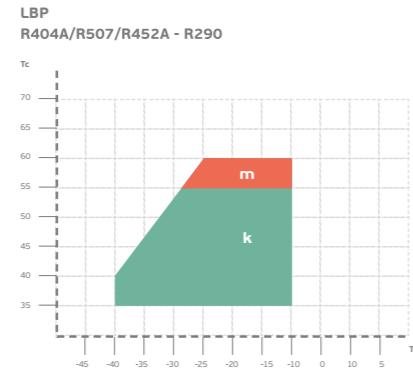
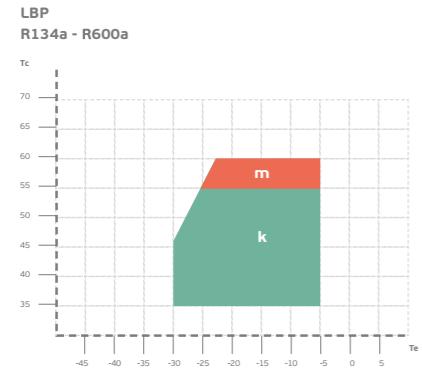
The Smart-Drop-In was designed with focus on cooling capacity, but always considering good system efficiency. This solution provides a customization tool that allows the routine to be parameterized and adjusted for each refrigeration system. The logic is divided in four mains parts: Pull-down, Stability Routine, Heavy Duty Routine and Defrost Routine. The Stability, Heavy Duty and Defrost Routine begin to run in parallel after Pull-down is completed.



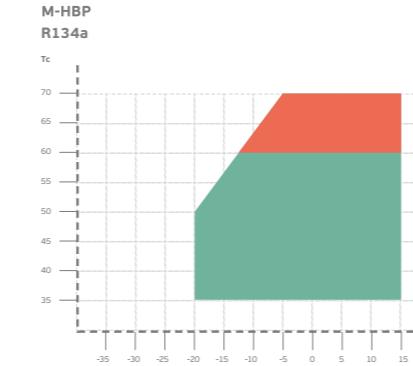
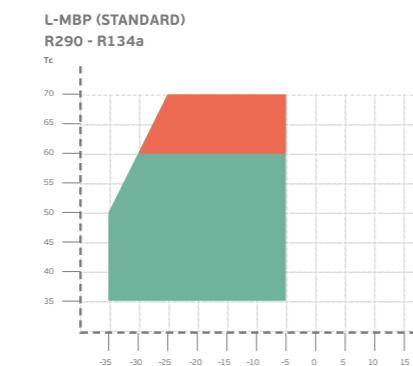
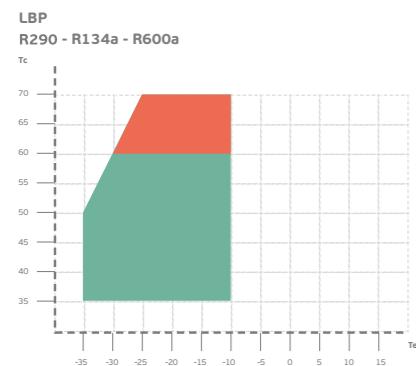
embraco
Nidec

OPERATING ENVELOPE

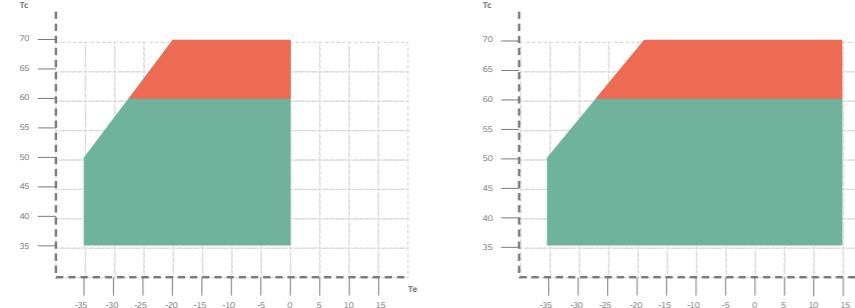
EMC, EMX, NE, NT, NJ, VNE, EH



EM, EG, F, VEM, VEG, VES, FMF
Ambient temperature: 42,7 °C - Return temperature: 32,2 °C



L-MBP EXTENDED RANGE FFUS, EM2, EM3
R290 - R134a - R600a



Operation Condition
Transient Condition

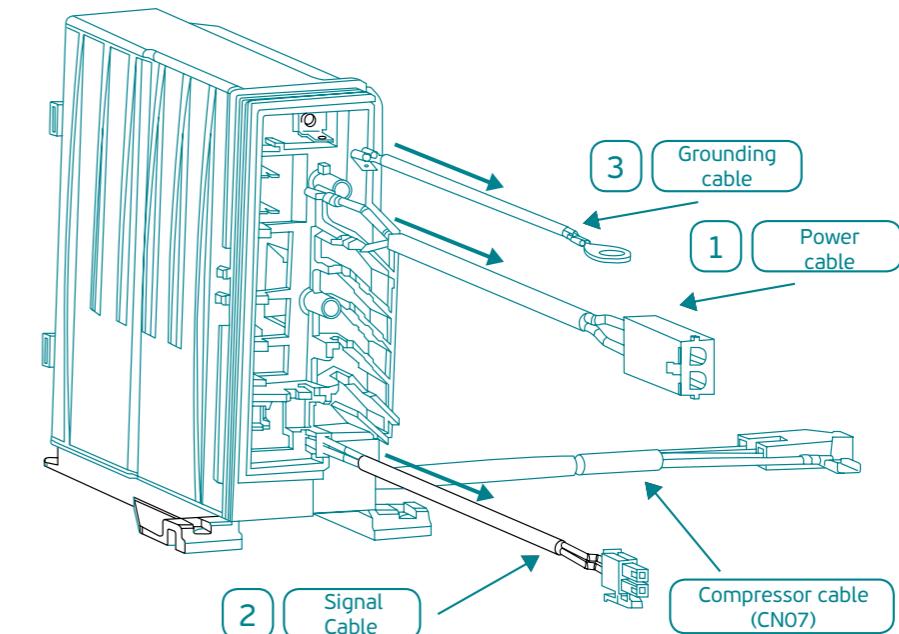
Tc Condensing Temperature
k Ambient 32°C and return gas 20°C
Te Evaporating Temperature
m Ambient 32°C and return gas 20°C
(for transitory period)

NOTE: usage of compressors outside the intended working range cannot make use of the warranty, or should be consulted with Technical support.

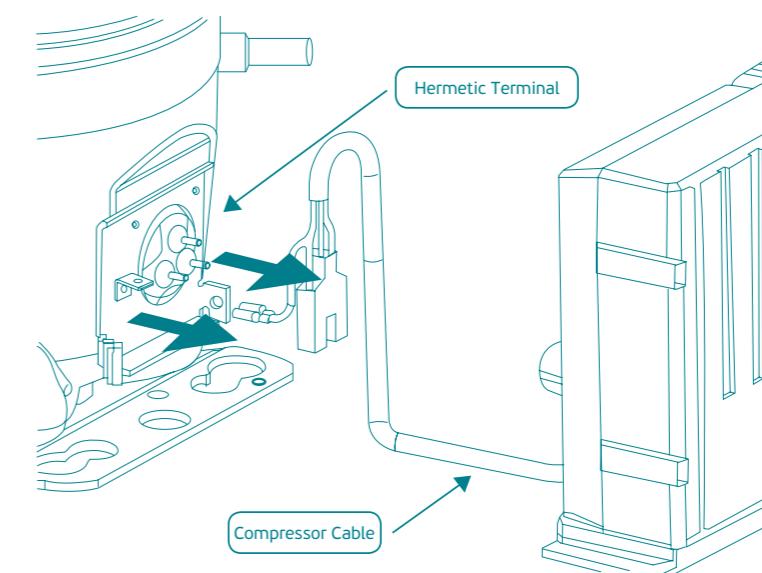
01 REPLACING A FAILED INVERTER

To replace the original inverter in the system, follow the steps:

1. Remove the Inverter plastic cover to have access to the electrical terminal;
2. Remove the power cable (1), the signal cable (2) and the grounding cable (3);



3. Disconnect the Inverter from the compressor;

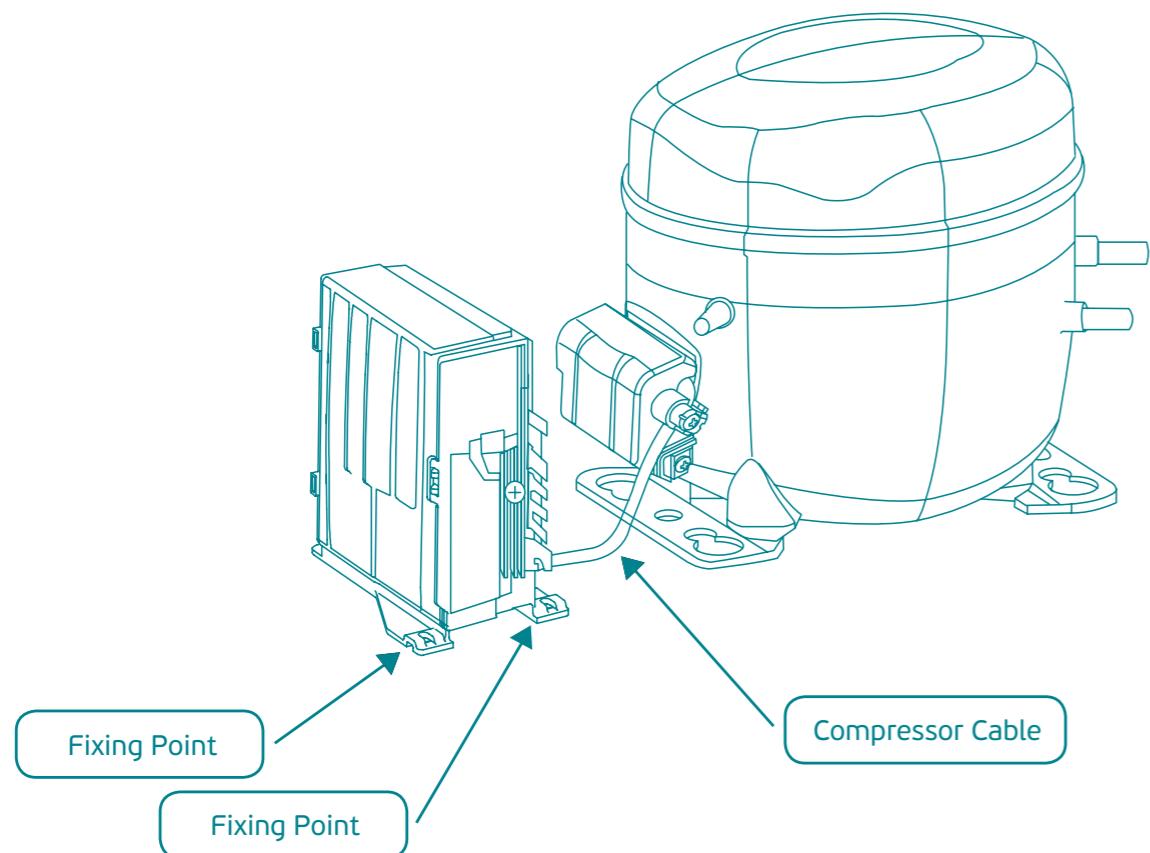


4. Unscrew and remove the inverter from the system;

02 INSTALLING THE NEW INVERTER

1. Select the new inverter following the instructions shown above;

2. Fixate the Inverter on the system using the fixation points;



Obs.: If the original Inverter was mounted on the compressor, the new Inverter must be installed on the system to make sure that it doesn't move during the normal system usage.

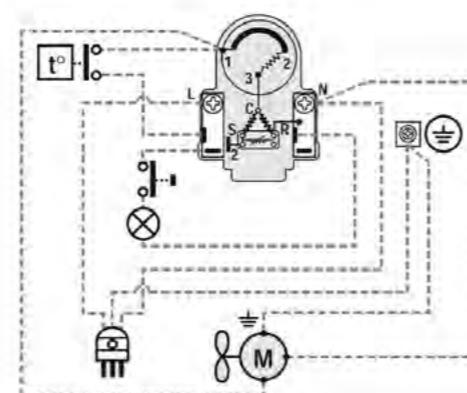
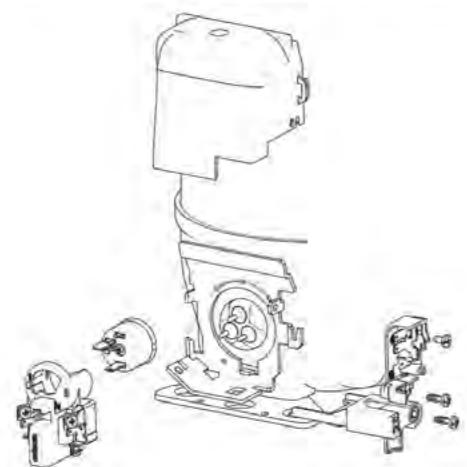
12 ELECTRICAL CONFIGURATIONS

WIRING DIAGRAMS KEY

	OVERLOAD PROTECTOR		PTC START DEVICE*
	OVERLOAD PROTECTOR		INTEGRATED PTC DEVICE
	CURRENT START RELAY		CURRENT START RELAY WITH CAPACITOR CONNECTIONS
	3CR CURRENT START RELAY		3ARR3 START RELAY (VOLTAGE).
	RUN CAPACITOR		RUN CAPACITOR (MANDATORY - NOT SUPPLIED)
	OPTIONAL RUN CAPACITOR		START CAPACITOR
	FAN		PUSH BUTTON
	LAMP		SINGLE PHASE MOTOR
	3-PHASE MOTOR		THERMOSTAT
	LOW-HIGH PRESSURE SWITCH		PILOT CIRCUIT 24 OR 220 V
	EARTH CONNECTION		COMMON (INTERNAL OVERLOAD PROTECTOR)
	3-PHASE SUPPLY		START
	SINGLE PHASE SUPPLY		BROWN CABLE
	COMMON		BLACK CABLE
	RUN		RED CABLE
	TERMINAL BLOCK		CONNECTIONS TO BE MADE BY THE CUSTOMER (NOT SUPPLIED)
<u>Wh</u>	WHITE CABLE		
<u>Bl</u>	BLUE CABLE		
<u>Yg</u>	YELLOW-GREEN CABLE		
—	CONNECTIONS SUPPLIED		

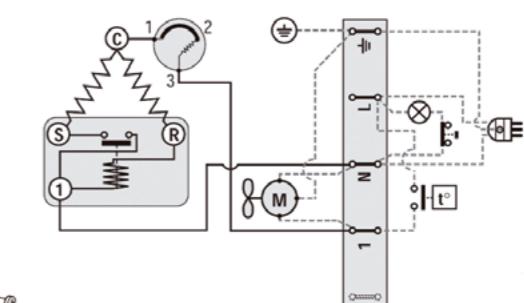
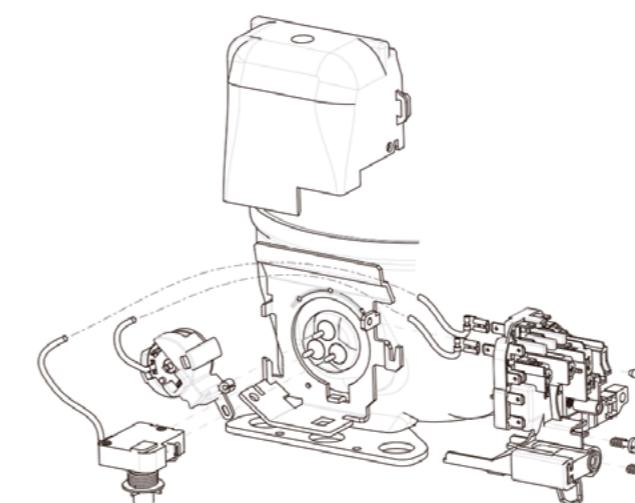
WIRING DIAGRAMS

SM00 - EMT/NE SERIES RSIR PTC European Version

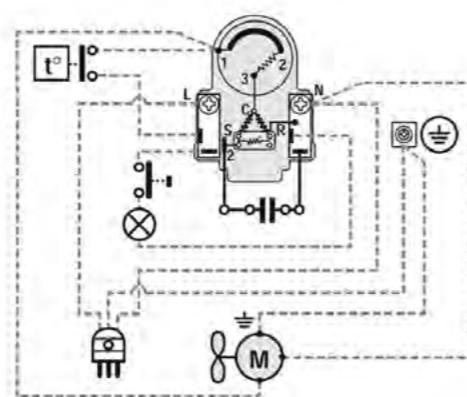
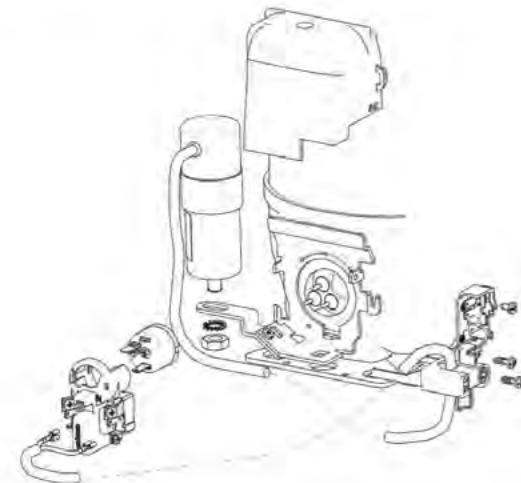


WIRING DIAGRAMS

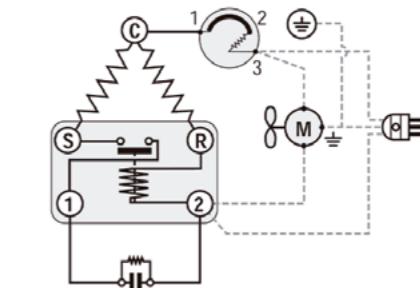
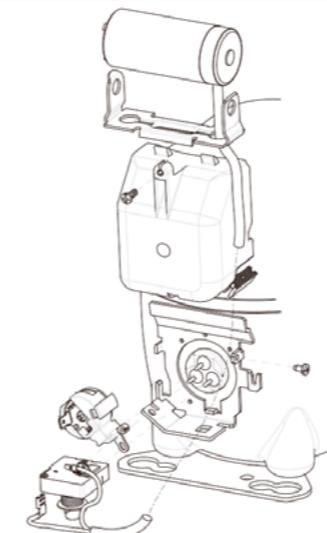
SM03 - EMT/NE SERIES RSIR Terminal Board & Start Device



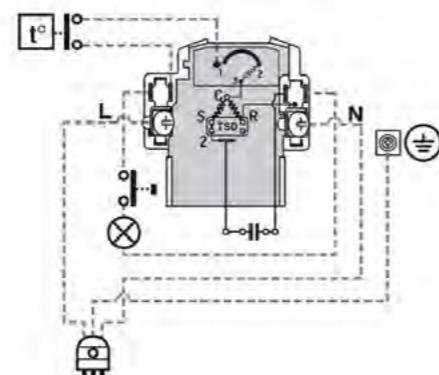
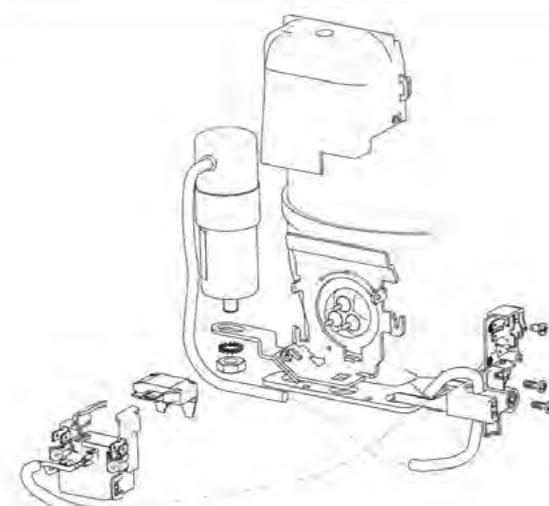
SM01 - EMT/NE SERIES RSCR PTC European Version



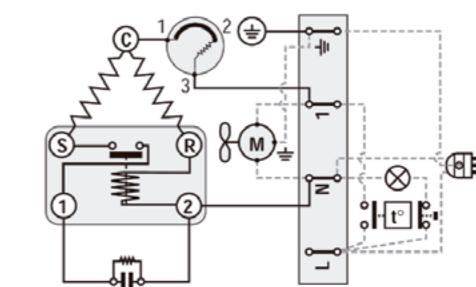
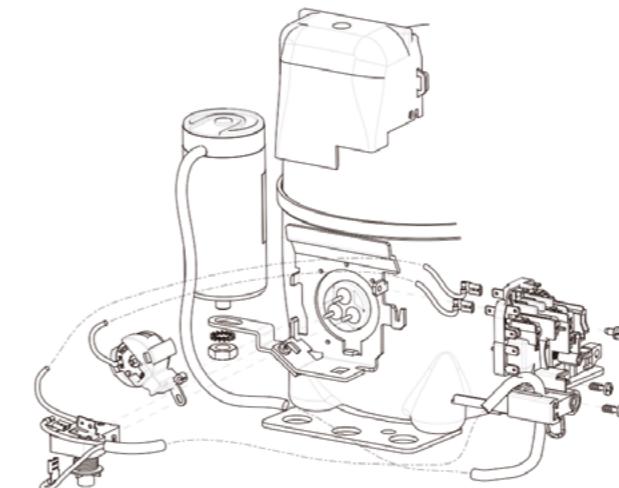
SM04 - EMT/NE SERIES CSIR American Version



SM02 - EMT/NE SERIES RSCR TSD European Version

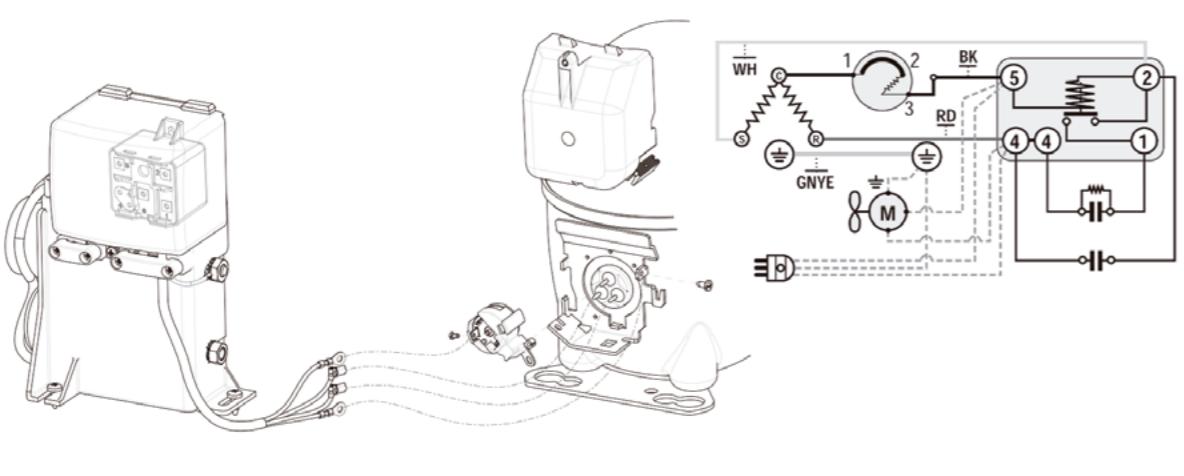


SM05 - EMT/NE SERIES CSIR Terminal Board & Start Device

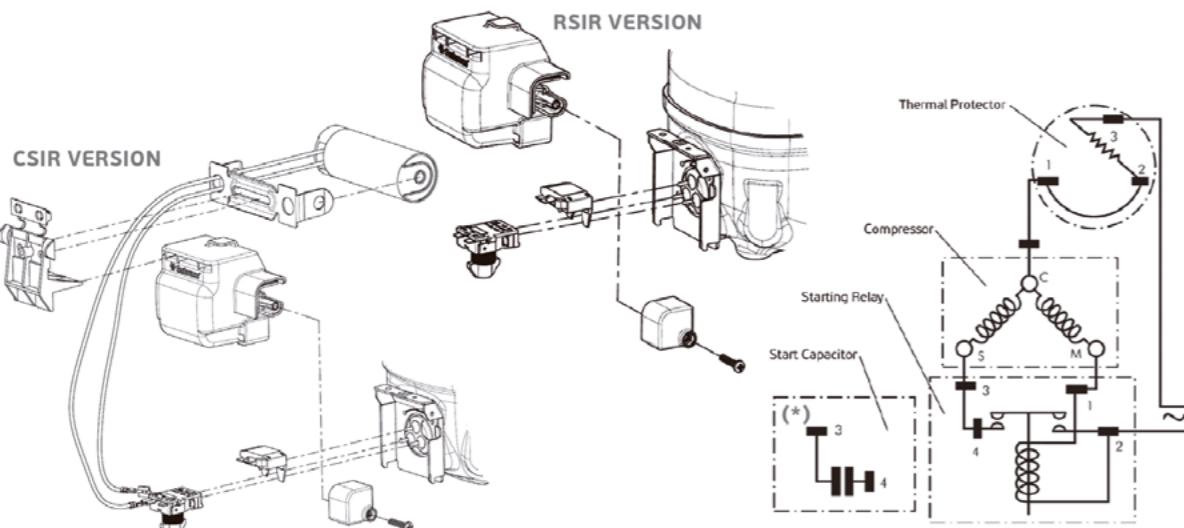


WIRING DIAGRAMS

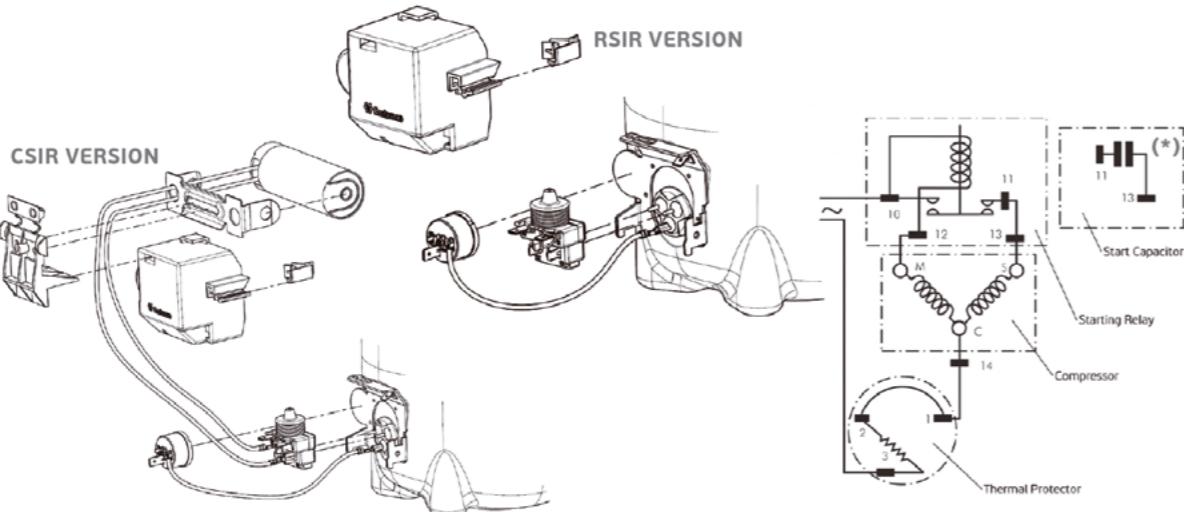
SM06 - NE SERIES CSR Box



SM07 - EM/EMI

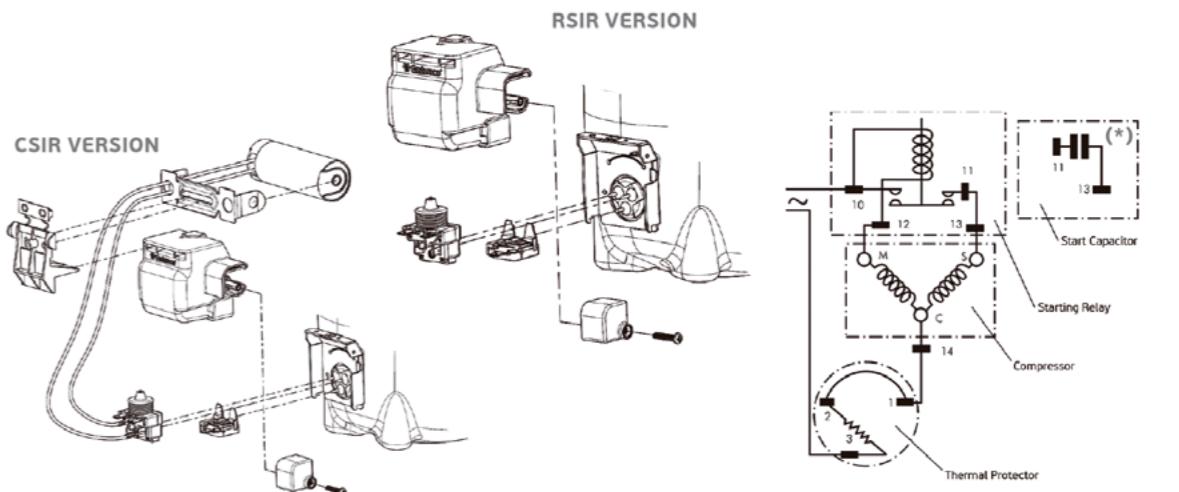


SM08 - F COMPRESSORS

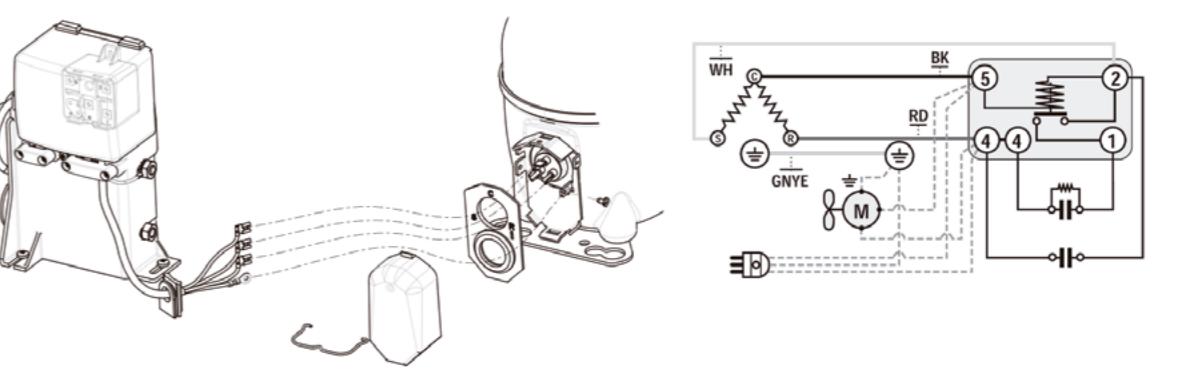


(*) Valid only for CSIR version

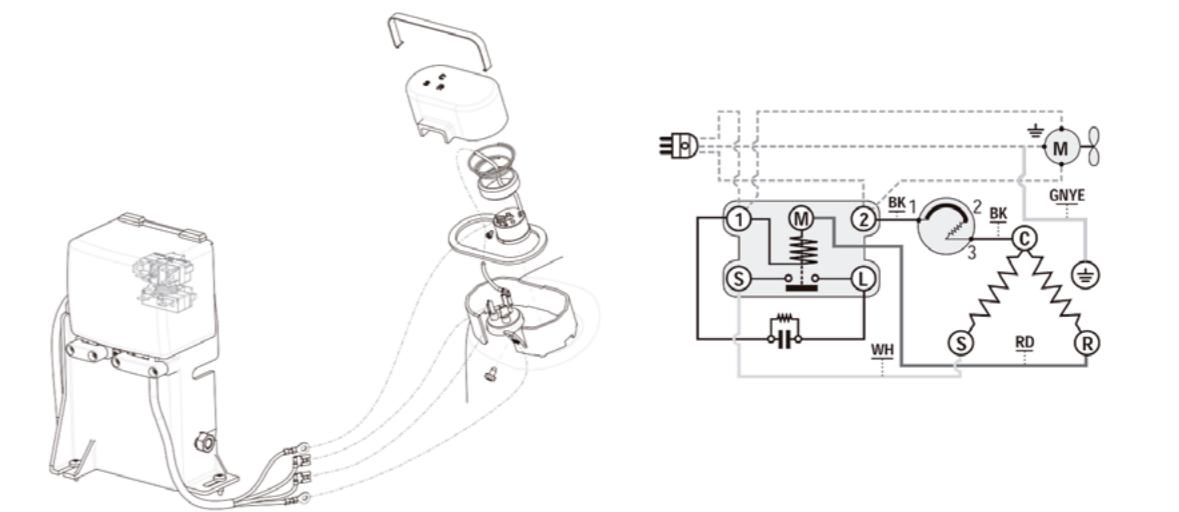
SM09 - EG



SM10 - NE CSR Box

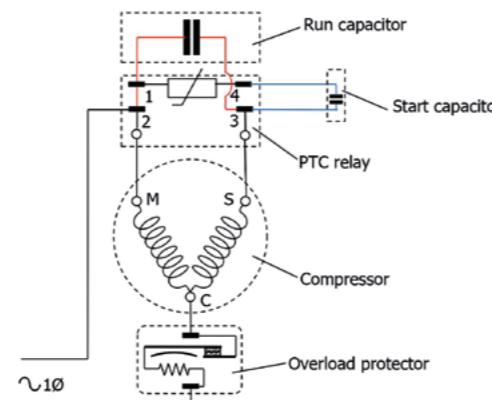
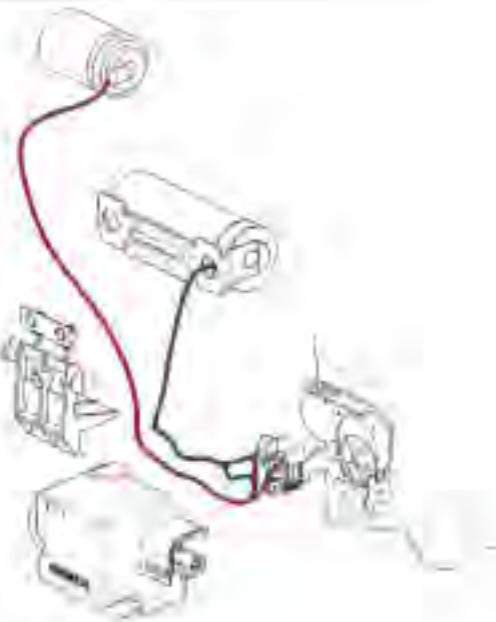


SM14 - NJ CSIR Box

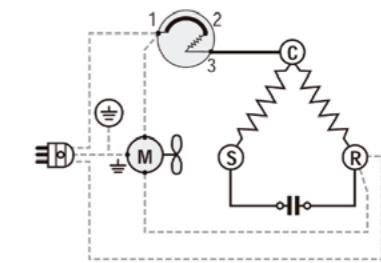
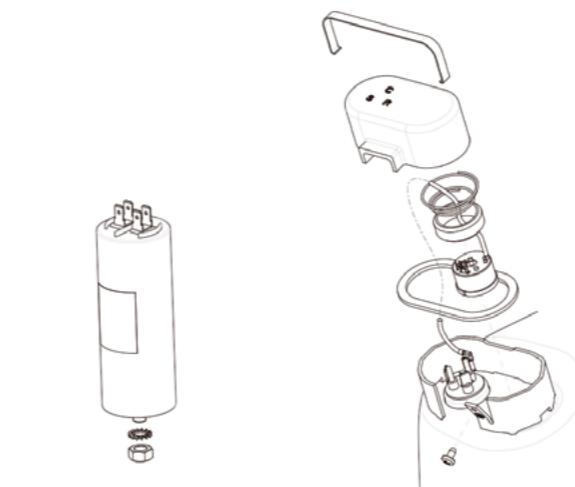


(*) Valid only for CSIR version

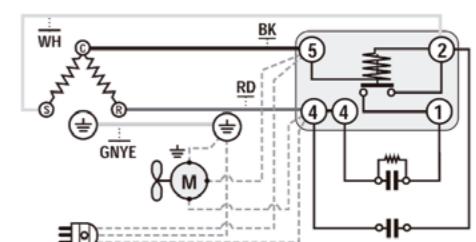
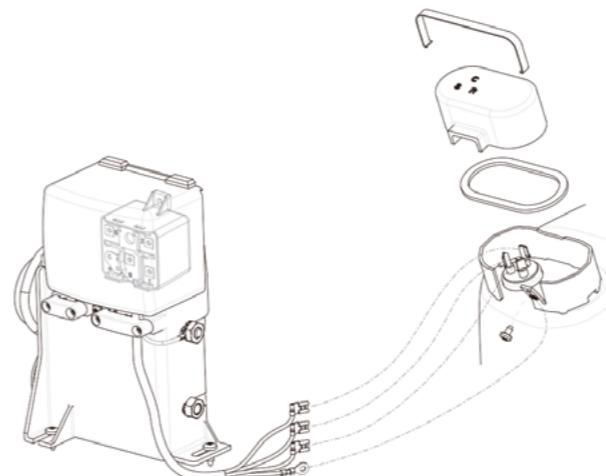
F - COMPRESSOR



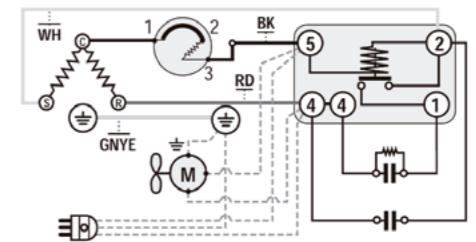
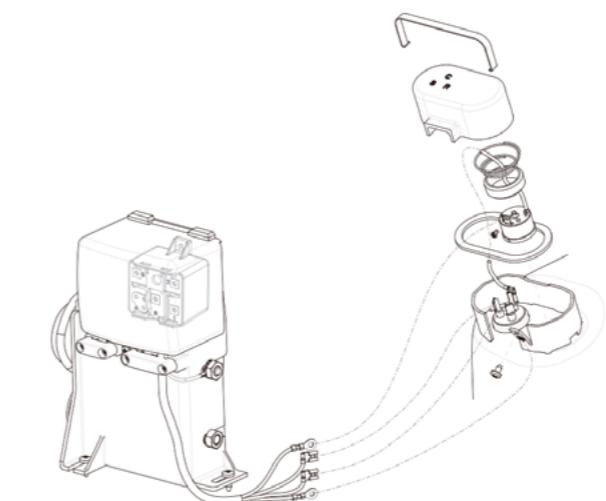
SM15 - NJ PSC



SM16 - NJ SERIES CSR Box (Internal Overload Protector)

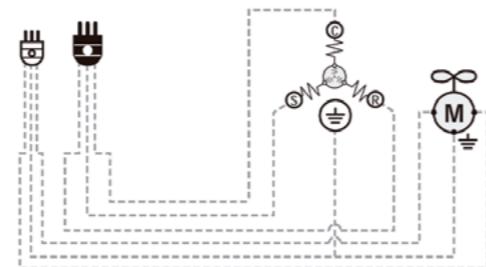


SM17 - NJ CSR Box (External Overload Protector)

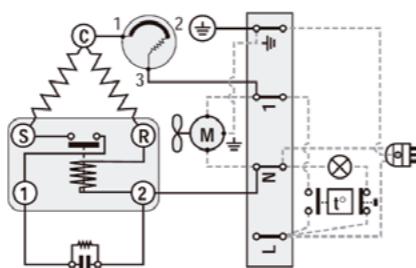
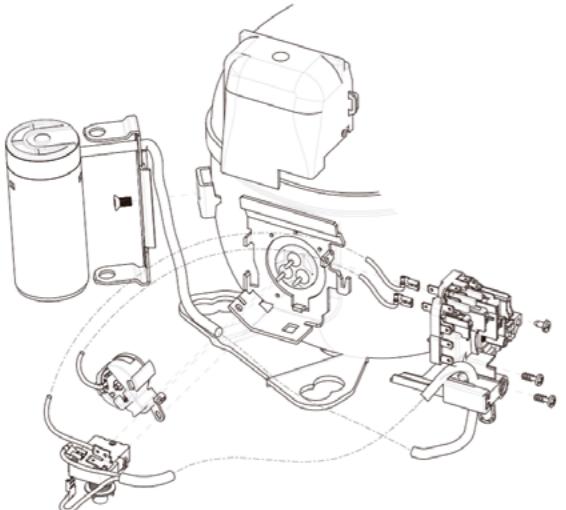


WIRING DIAGRAMS

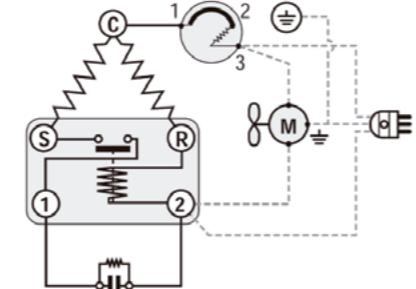
SM18 - NJ SERIES 3-Phase (Internal Overload Protector)



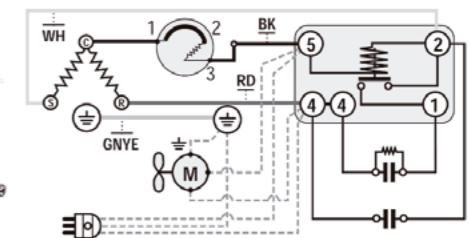
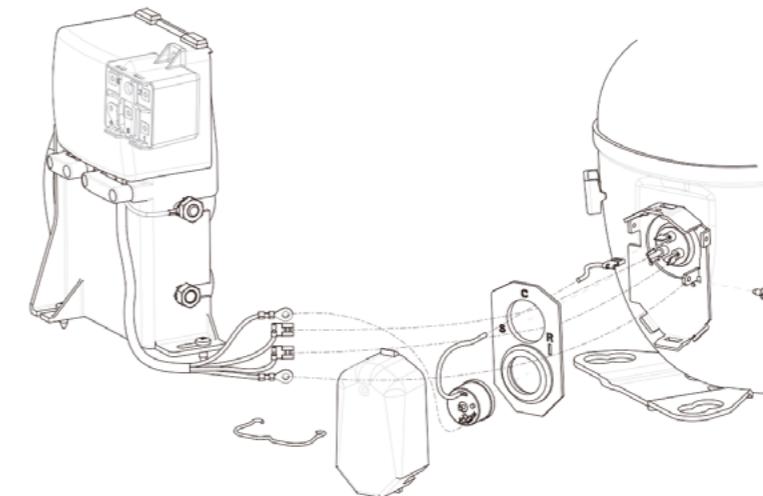
SM19 - NT SERIES CSIR Terminal Board



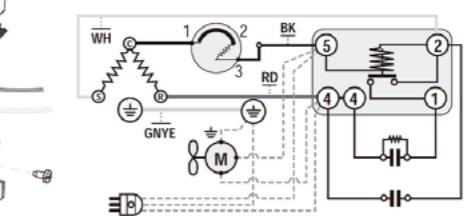
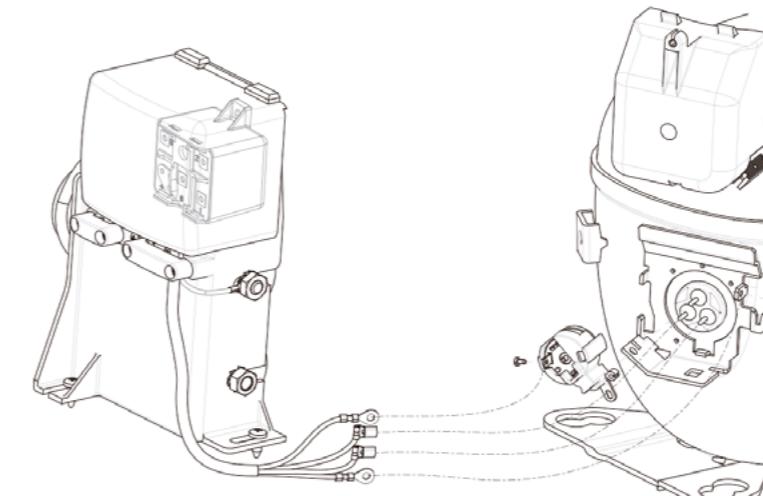
SM20 - NT SERIES CSIR – American Version



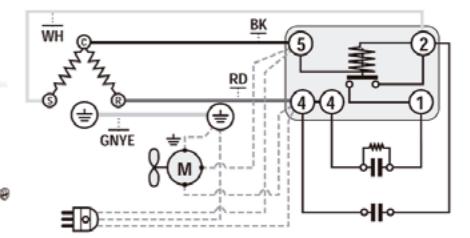
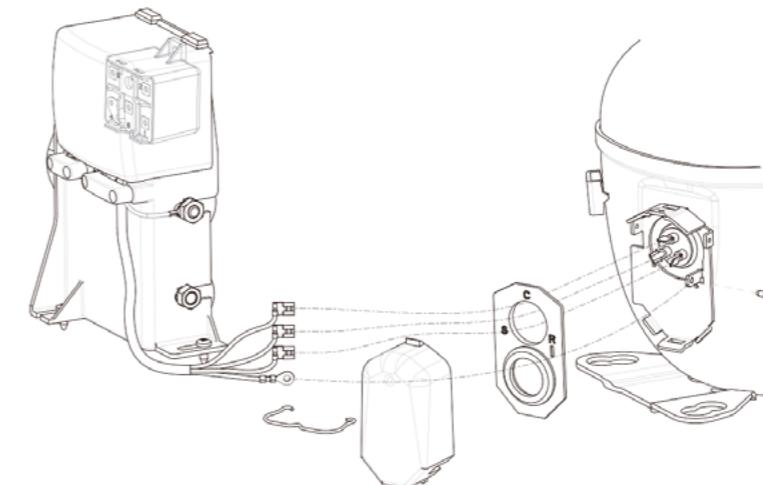
SM21 - NT SERIES CSR Box



SM23 - NT SERIES CSR Box

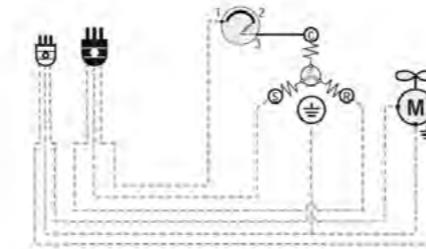
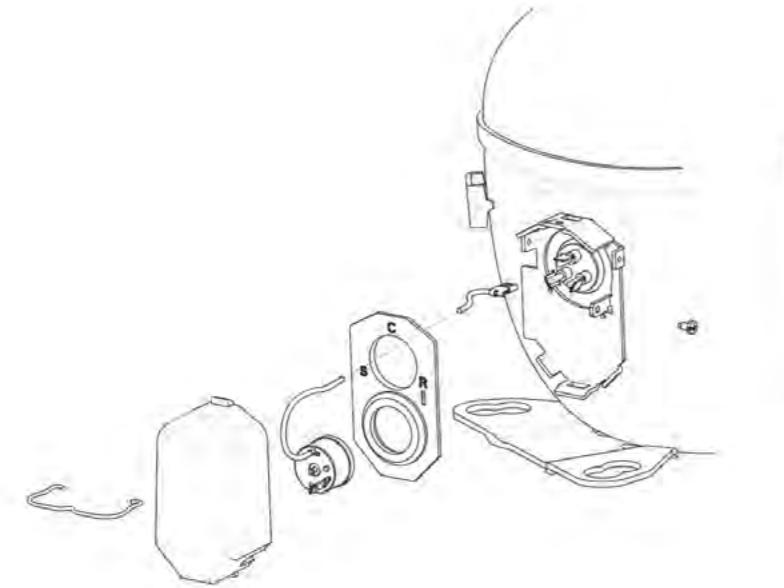


SM26 - NT SERIES CSR Box (Internal Overload Protector)

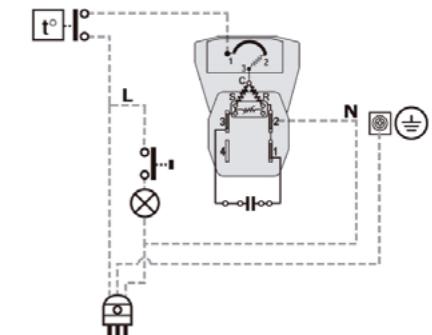
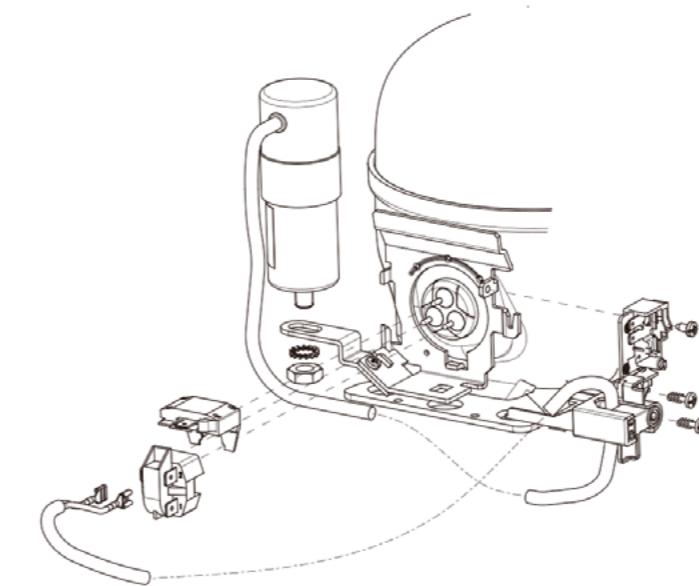


WIRING DIAGRAMS

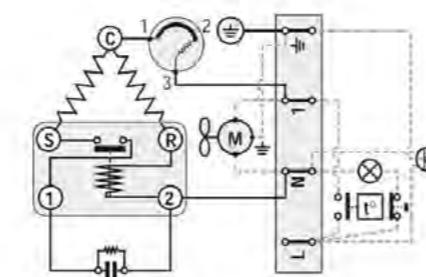
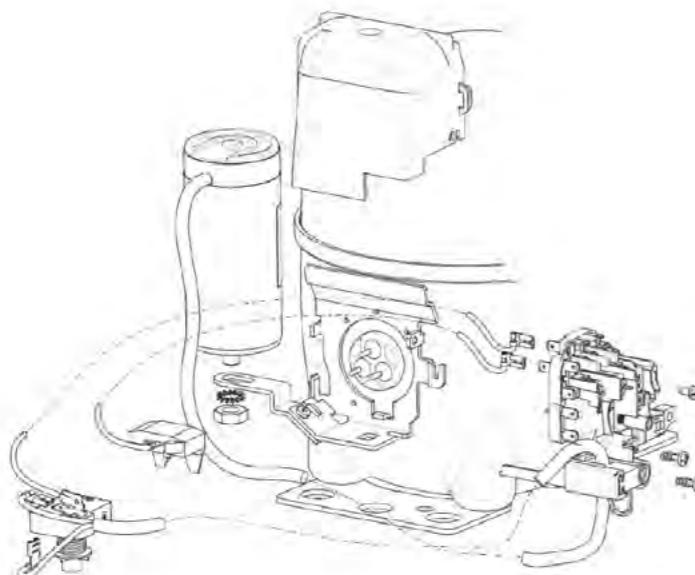
SM27 - NT SERIES 3-Phase (Internal + External Overload Protector)



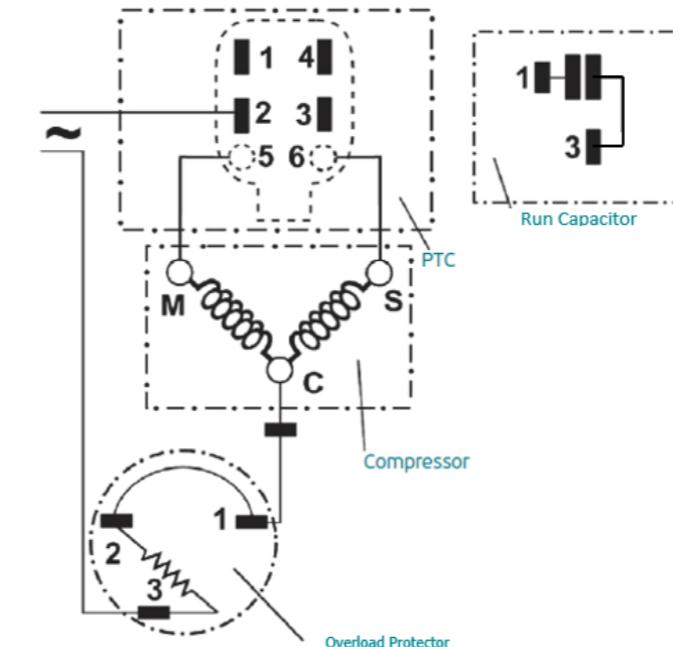
SM32 - EM RSCR PTC & 4TM



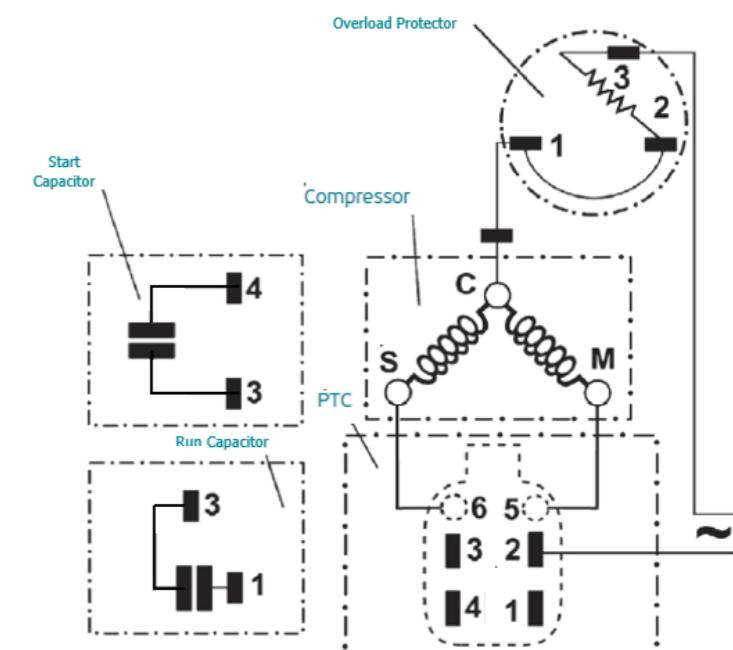
SM29 - EMX SERIES CSIR TERMINAL BOARD & START DEVICE & 4TM



SM34 - EG,F RSCR

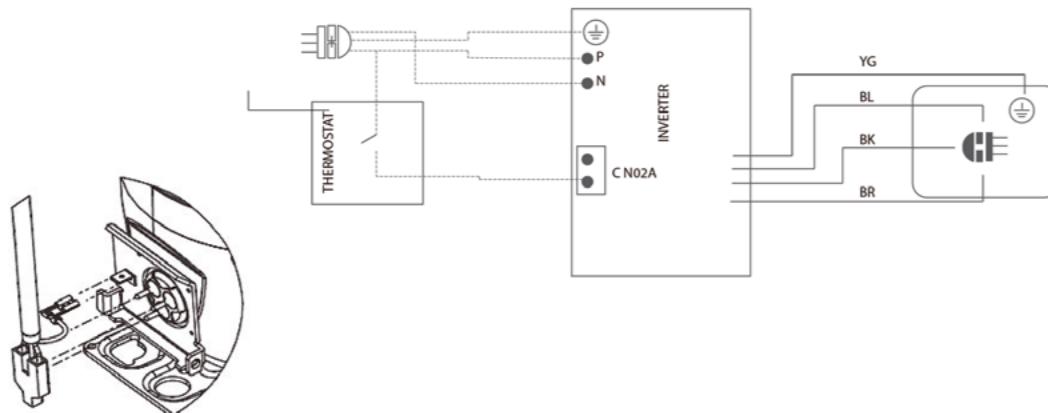


SM33 - EM CSCR

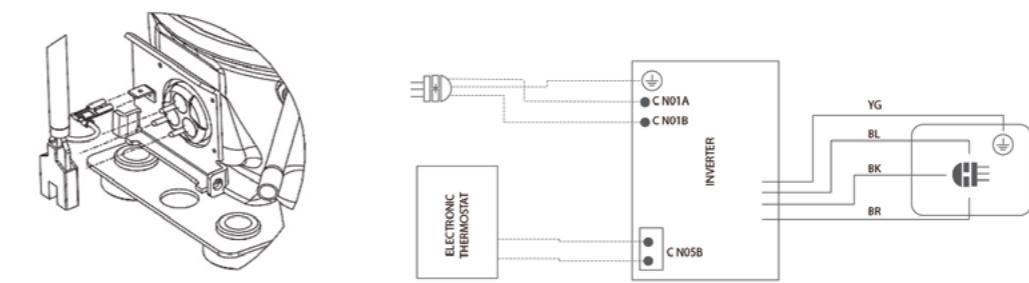


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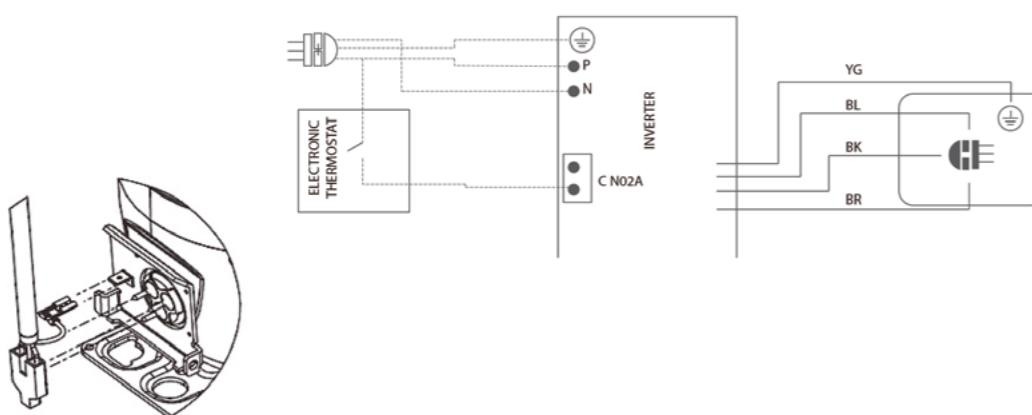
CON01 - VEMY6 / VEG (Drop-in)



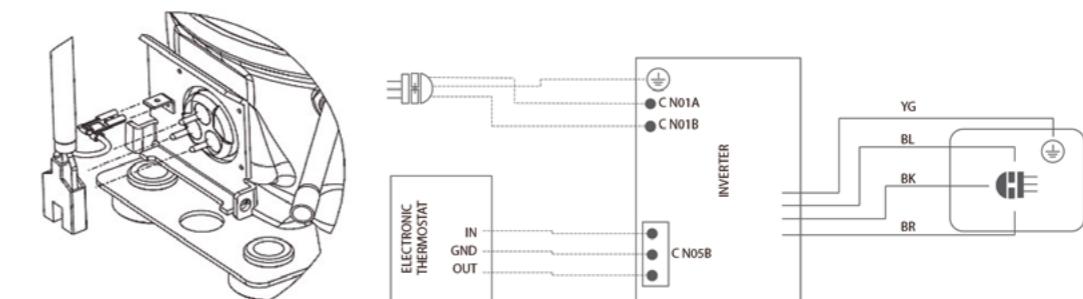
CON04 - VEM (Frequency)



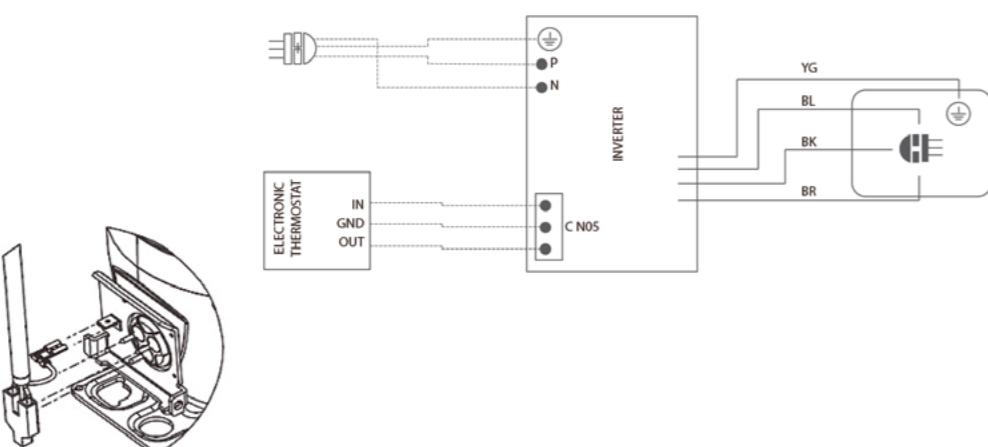
CON02 - VEM / VEG (Frequency)



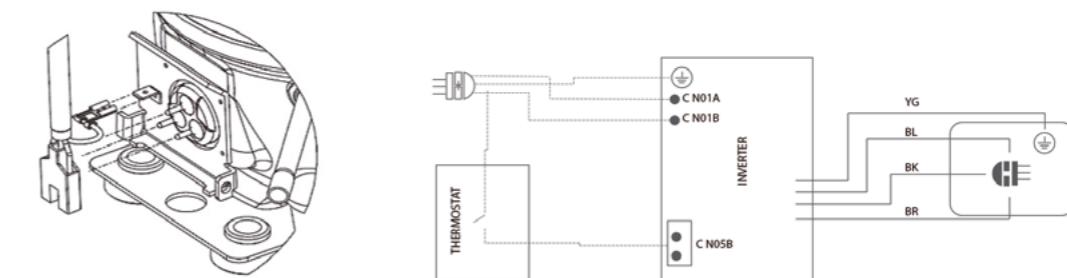
CON05 - VEM (Serial)



CON03 - VEMY6 / VEG (Serial)

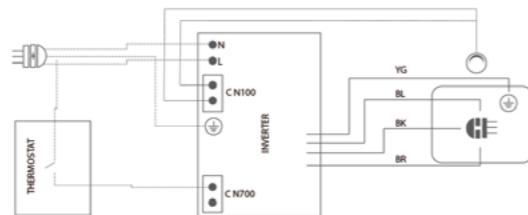
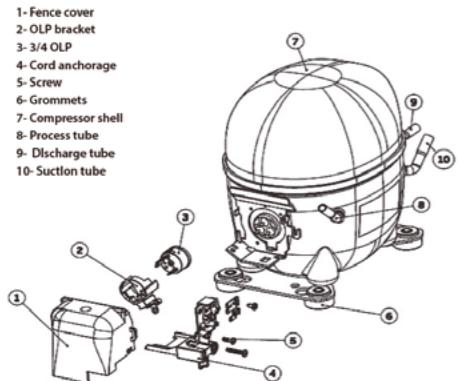


CON06 - VEM (Drop-in)

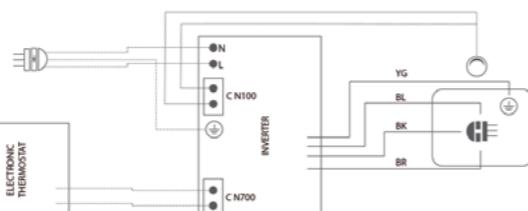
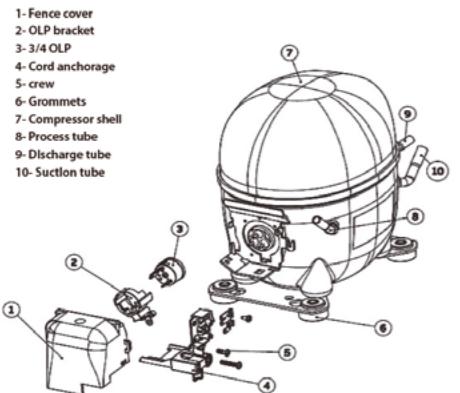


WIRING DIAGRAMS

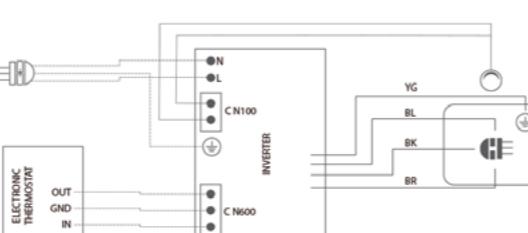
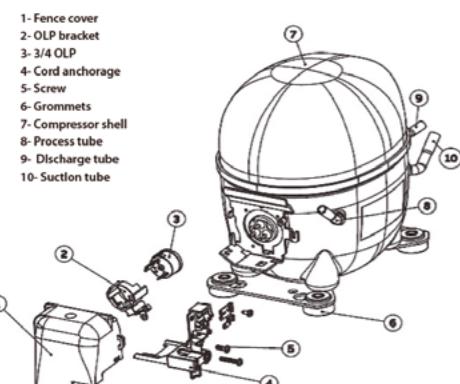
CON07 - VNE (Drop-in)



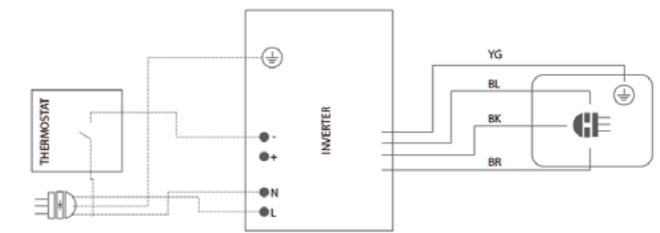
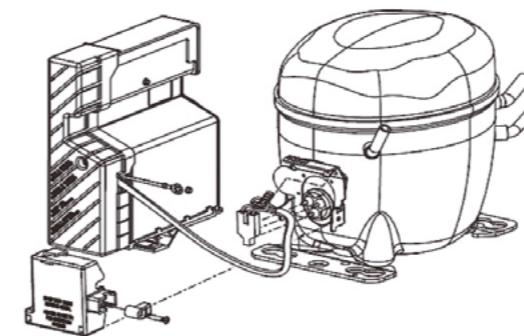
CON08 - VNE (Frequency)



CON09 - VNE (Serial)



CON10 - VEG/FMF (Drop-in)



13 RECOMMENDATIONS

1 - ELECTRICAL ACCESSORIES

Before removing the compressor plastic protection cover, check if the compressor is fully disconnected from the power source and if capacitors are applied.



Never operate on any electrical accessory with the compressor connected to the power grid. Working on an electrified compressor can cause severe damages to the technician's health, causing risks of electric shocks or getting burnt.



Start and/or run capacitors must be handled carefully, because, even when disconnected, they can cause electric shocks.

When you need to remove the capacitors, disconnect this components carefully paying attention to the exposed electric terminals. After disconnected, the capacitor must be discharged. Check if the capacitance ranges (μF) printed on the label on the capacitors are in accordance with the compressor's technical data. The capacitor's voltage must be the same or higher than the specified value in the compressor's technical data. In case the capacitor or compressor's specification don't match, replace the capacitor.



The application of the wrong capacitor, not specified component, may cause overheating of these components. Overheating may cause fractures on the capacitor which can lead to the leakage of internal content burning the operator.

In the case of removing the electrical components from the compressor's hermetic terminal, first remove the overload protector and the start device (relay or PTC) applying longitudinal force on the terminal pins. Never apply transversal force on the pins of the hermetic terminal.



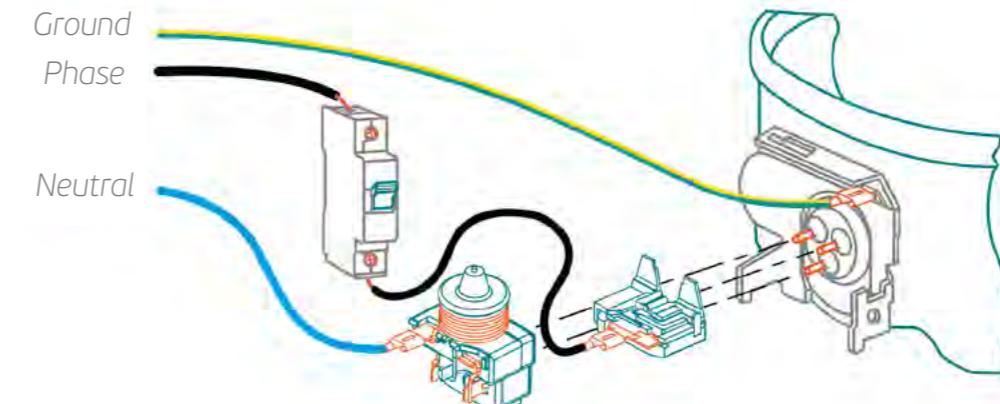
The incorrect removal of these accessories may damage the hermetic terminal on the compressor which can lead to the hermetic pins to be dislodged, causing refrigerant leakage. This situation becomes more critical in the case of flammable refrigerant utilization, since associated with an ignition source, creating a risk of and exposed flame with serious risks to the technician's physical integrity.

Cross check the code printed on the overload protector, relay or PTC with the compressor's technical data. In case they are different, replace these components for a compliant one. Universal accessories don't exist, you must always use components specified on the compressor's technical data.

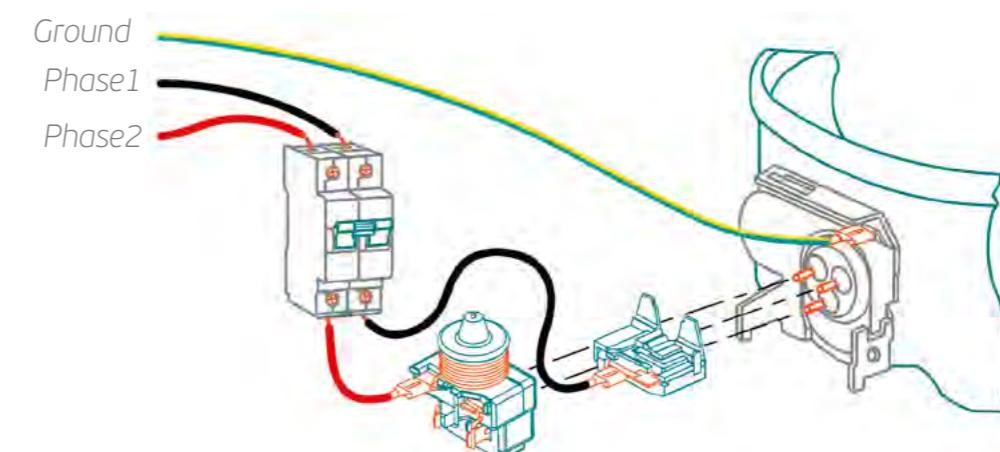


The use of incorrect electrical components, (overload protector, starting device) can cause a short circuit in the region the hermetic terminal of the compressor, which can lead to the hermetic pins to be dislodged, causing refrigerant leakage. This situation becomes more critical in the case of flammable refrigerant utilization, since associated with an ignition source, creating a risk of and exposed flame with serious risks to the technician's physical integrity.

1 - ELECTRICAL INSTALLATION



On single-phase installations, the phase wire must be protected by a circuit breaker and connected to the overload protector. The Neutral wire must be connected to the start device (Relay or PTC). The system must be grounded.



On two-phase installations, the use of a bipolar circuit breaker is mandatory, because in case of a short circuit, both phases will be protected. The system must be grounded.



When this bipolar starter isn't applied, the system is exposed to a short circuit in the region the hermetic terminal of the compressor, which can lead to the hermetic pins to be dislodged, causing refrigerant leakage. This situation becomes more critical in the case of flammable refrigerant utilization, since associated with an ignition source, creating a risk of and exposed flame with serious risks to the technician's physical integrity.

The usage of a not grounded system can generate severe risk of an electric shock on the technician.

2 - COMPRESSOR

If the compressor's replacement is necessary, be aware to these points below:

- I. Check if the compressor is disconnected from the power grid.



You must never handle any electrical accessory with the compressor connected to the power grid. This can prevent several health risks to the technicians, such as electric shocks or getting burnt.

- II. You must never remove the compressor without first removing all the refrigerant inside the system. You can use refrigerant recovery. In the case of replacing compressors with flammable refrigerants, such as R290 or R600a, make sure to remove the whole charge from the system.



The presence of flammable fluid residues can expose the technician to risks.

- III. You must always use a pipe cutter to disconnect the pipes from the compressor. Under no circumstances, use the flame torch to disconnect the compressor tubes.



The use of a torch to disconnect the compressor from the system operating with flammable refrigerant can cause fire and release of toxic vapors.

- IV. In case of compressor failure and / or internal contamination of the system, clean the refrigeration circuit with a suitable solvent, following the technical guidelines of the solvent manufacturer.



Failure to comply with the solvent manufacturer's technical guidelines may expose the technician to risk of fire or intoxication.

- V. Before turning the compressor on:

- Check if the voltage specified on the compressor label in accordance with the power grid and system electrical installation, following item 1.1.



The application of a compressor with a wrong voltage can cause a short circuit in the region of the hermetic terminal of the compressor, which can lead to the hermetic pins to be dislodged, causing refrigerant leakage. This situation becomes more critical in the case of flammable refrigerant utilization, since associated with an ignition source, creating a risk of an exposed flame with serious risks to the technician's physical integrity.

- Check if the electrical protection plastic cover is properly inserted.



Failure to use or improperly fix the plastic cover on the electrical terminal may expose the technician to risk of electric shock and fire.

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