



# BREAKERMATIC® PFN

## Voltage protection module for refrigerators

### Overview

The BREAKERMATIC PFN is a voltage protection module designed to be incorporated as an original part into refrigeration equipment with compressors up to 1 HP at 120 VAC or 2 HP at 220 VAC. It can be used in refrigeration and freezing equipment such as bottle racks, horizontal and/or vertical display cases, visicoolers, etc.

It connects via Fast-on terminals, which facilitates assembly on the production line.

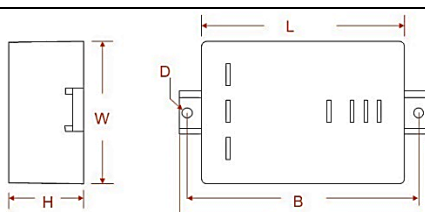
### Operation

1. **Protection against steady-state voltage variations.** The PFN disconnects the output if the steady-state voltage is above the high cut-off voltage or below the low cut-off voltage indicated in the specifications. The response time to a fault is typically 1.5 s. The voltage must remain outside the range longer than the response time for the disconnection to be activated. While the fault is present, the voltage fault indicator will remain illuminated.
2. **Reconnection delay or standby cycle.** When the protector is energized, or at the end of a voltage failure, the protector will initiate a time delay before connecting the output. The duration of the time delay is indicated in the specifications. The standby cycle protects sensitive equipment from short operating cycles, allowing, in the case of A/C and refrigeration equipment, system pressures to equalize before reconnecting. While the output is off, the wait cycle signal will remain on. Once the wait cycle ends, the output is activated, the wait cycle indicator turns off, and the normal voltage indicator turns on.
3. **Autostart.** This feature reduces the standby cycle to 5 seconds when the protector has been off for a considerable amount of time.
4. **Blackout, sag, etc. detection.** The protector will disconnect the load if it detects a sudden voltage drop below 50% of the nominal voltage and initiate a standby cycle. The blackout detector responds instantly when the criteria in the specifications for the minimum blackout duration are met.

### Models

Model	Nominal Voltage	Nominal amperage	Frequency	No Phases	Cut off voltages	Reconnection delay	Response delay	Language
PFN110-080EST	120VAC	10A	50/60 Hz	1	Fijo 95V – 138V	3:45	1.5s	Eng. – Spa.
PFN110-150EST	120VAC	15A	50/60 Hz	1	Fijo 95V – 138V	3:45	1.5s	Eng. – Spa.
PFN110-300EST	120VAC	30A	50/60 Hz	1	Fijo 95V – 138V	3:45	1.5s	Eng. – Spa.
PFN220-150EST	220VAC	15A	50/60 Hz	1	Fijo 176V – 253V	3:45	1.5s	Eng. – Spa.
PFN220-300EST	220VAC	30A	50/60 Hz	1	Fijo 176V – 253V	3:45	1.5s	Eng. – Spa.

# Specifications

Electrical						
	PFN110-080	PFN110-150	PFN110-300	PFN220-150	PFN220-300	
Nominal Voltage	120	120	120	220	220	VAC
Nominal Frequency	50 - 60					Hz
Steady state voltage protection						
Low cut-off voltage	95 +/- 3%	95 +/- 3%	95 +/- 3%	176 +/- 3%	176 +/- 3%	VAC
High cut-off voltage	138 +/- 3%	138 +/- 3%	138 +/- 3%	253 +/- 3%	253 +/- 3%	VAC
Reconnection Hysteresis	5 - 10					VAC
Response delay	1 +/- 20%					s.
Reconnection delay cycle	4:00 +/- 20%					Min:sec
Blackout detection						
Minimum blackout duration (0% nominal voltage)	32 -64					ms
Minimum brownout duration (50% nominal voltage)	>100					ms
Maximum load						
	PFN110-080	PFN110-150	PFN110-300	PFN220-150	PFN220-300	
Maximum Resistive Load (cos φ = 1)						
Current (Amperage)	10	15	30	15	30	A
Power	0.96	1.8	3.6	3.3	6.6	KW
Conventional Refrigeration equipment						
Compressor Nominal Power	1/3	1/2	1	1/2	2	H.P.
Maximum Input power	1	1.8	3.6	2.2	3.5	KW
Maximum continuous current (Amperage) (MCC)	10	15	30	10	16	A
Mechanicals						
Dimensions						
						
			Total Length A	99.6	mm	
			Hole dist. B	91	mm	
			Hole Diam. D	4	mm	
			Length L	82.5	mm	
			Width W	57.5	mm	
			Height H	30.0	mm	
			Weight	97	gr.	
Connections						
Flat male terminals .250"						
Recommended female terminal: TE 41450-1 Quick disconnect, receptacle, 14-10 AWG						
Recommended terminal housing: TE 1-171706-1 Crimp Terminal Housings, Receptacle, Receptacle, 1 Position, Straight, UL 94V-0, Natural, Nylon, Mating Alignment, FASTON 250						
Isolation materials						
Enclosure	ABS					
Printed circuit board	FR4					
Flame retardant classification (UL94)						
Enclosure	V0, 5VA					
Printed circuit board	V0					
Isolation resistance (NTC1650:2004 Num 17.1)	>550					Mohms
Dielectric strength (NTC1650:2004 num 17.2)	>2					KV
Environmental						
Maximum operating ambient temperature	45					°C
Place of use: Indoor use, in a dry and ventilated place	Yes					
Outdoor use and/or in wet places	No					
Enclosure ingress protection IP ( IEC 60529)	IP40					

## Product certificates

NOM NOM-003-SCFI-2014 (NMX-J-515-ANCE)

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**BREAKERMATIC**

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CO13/5465

## Shipping packaging

Type	Capacity	Dimensions (Length xWidth x Height) (cm)	Model	Weight (Kg)
Carton CC 100	100 pcs	51 x 30 x 23	080 150 300	9.35 9.45 10.3

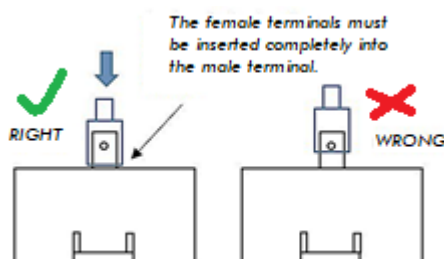
## Application notes

1. Choose an installation location inside the equipment that is not exposed to moisture generated in the equipment or introduced during maintenance.
2. To avoid overheating, the female terminal must be fully inserted into the male terminal.
3. To ensure proper operation of the protector, ensure that the temperature at the terminals does not increase more than 30°C above ambient temperature.
4. Use the appropriate wire gauge for the rated current of the equipment to be protected. It is recommended not to use gauges smaller than those indicated in the following table:

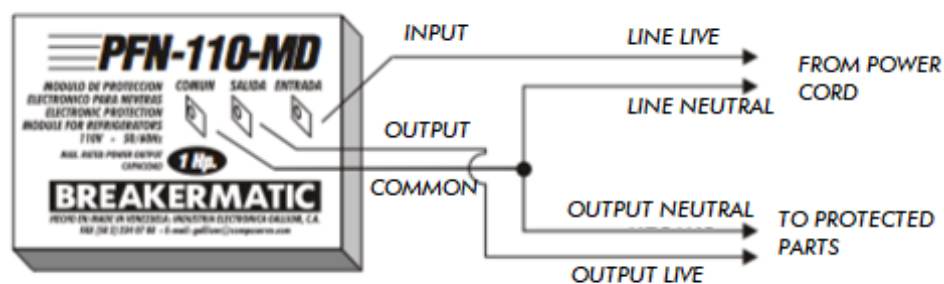
Nominal Current	Minimum wire gauge
16 A	AWG 14 75°C
25 A	AWG 12 75°C
30 A	AWG 10 75°C

5. Correct placement of the terminals

**Caution:** Correct insertion of the terminal is important to ensure proper operation of the protector. Applying power to an improperly inserted terminal causes heat buildup, which can damage the protector and the cables, creating a fire hazard.



## Connection diagram



### TYPICAL APPLICATION 220VAC REFRIGERATOR

