

Electronically Controlled PTC Starting Devices (ePTC) for P / T / D / N / F / S -Series

Introduction

The asynchronous motor of a single phase AC powered compressor has two windings, a main and an auxiliary winding. The auxiliary winding is powered high at start by means of a starting device, then powered down, often still utilized continuously by means of a run capacitor. The starting device of our standard PTC starters is a "Positive Temperature Coefficient" resistor, PTC. When heated up during the start phase, the PTC almost cuts off the current to the auxiliary winding, leaving only enough current to keep itself heated to this closing level.

The associated heat loss amounts to approximately 2.5 W. With the ePTC this loss can be reduced down to approximately 0.4 W by an extra electronic circuit.

Features

The electronic design of the starting device offers some strong features such as:

- Compressor restart possible after a few seconds.
Only a very short cooling time is necessary due to the electronic design.
- Operational wattage loss reduced by 2 watt
- PTC protection screen not needed, surface temp. < 82 °C (179.6 °F)
- Temperature resistant up to min. 60 °C (140 °F)

Functional description

The main component of the ePTC is the same PTC pill like in other 220–240V 103N.... Secop PTC starters. Thus the start of the compressor motor is performed in the same way. In standard PTC starters the >2 W energy loss to keep the PTC heated during compressor operation are not avoidable.

In the ePTC a small electronic circuit cuts off the current through the PTC a short time after start and thus reduces the energy loss down to an approx 0.4W. The switch used is a Triac, an electronic AC switch, controlled by a timer circuit. As the timer circuit has a short reset time and the main PTC cools down during compressor operation, the full start torque will be available after approx 6 seconds compressor off time. However, if it is a LST starting device, full pressure equalization is needed before start.

Connection and terminals

The wiring diagram shows how to make the connections. The two screw terminals marked N and L are for supply voltage. The spade on the L terminal and the spade marked C are for the thermostat. The spade marked S at the top right position is internally connected to the start (or auxiliary) fuse terminal. This spade together with N is used for a run capacitor. The spade marked N at the top left position is internally connected to the neutral screw terminal. The spade marked C at the bottom position is internally connected to the common fuse terminal. On the rear side of the ePTC starter there are three holes. The hole in the bottom is for the common fuse terminal on the compressor. The top left hole is for the start fuse terminal and the top right hole is for the main fuse terminal. The ePTC starter is mounted with the C spade downwards.

EMC optimised ePTC versions ("E-2")

Starting second quarter 2012 Secop had shipped EMC optimised ePTC versions ("E-2"). An added "gate cap" filter on the PCB ensures improved Electromagnetic Compatibility (EMC).

Technical data

Electronically controlled PTC (version E-2) can alternatively be used for P / T / D / N / F / S -Series		
Code number	103N0050 (25 Ohm) 103N0055 (38 Ohm)	103N0058 (5 Ohm)
Nominal supply voltage	220 – 240 V, 50/60 Hz	115 V, 60 Hz
Minimal supply voltage	187 V	90 V
Maximal supply voltage	254 V	140 V
Power consumption	approx. 0.4 W (after 2 s)	approx. 0.5 W (after 2 s)
Spade connectors	4.8 mm (3/16 inch)	6.3 mm (1/4 inch)
Cables	temperature resistant up to min. 60 °C (140 °F)	
Run capacitor	optional	
Ambient temperatures	from 0 °C (32 °F) to 50 °C (122 °F) during operation from -20 °C (-4 °F) to 70 °C (158 °F) during transport	
Enclosure	IP 00	
PTC protection screen	not needed, surface temp. < 82 °C (179.6 °F)	



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