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Application Engineering Europe

SINGLE PHASE SCROLL START ASSIST COMPONENTS

1 Starting components are not normally required

Due to the inherent design of the Copeland Scroll, the internal compression components start unloaded, **even if system pressures are not balanced**. Since the compressor's internal pressures are balanced at startup, low voltage starting characteristics are excellent, and starting components **are not normally required**.

2 For weak power supplies

When weak power supply is encountered, starting current on **any** compressor may result in a significant "sag" in voltage that reduces the starting torque of the compressor and increases the start time. This could influence the rest of the electrical system in the building by lowering, for a period of 300-to-400 milliseconds, the voltage to the lights etc. This momentary low voltage, **caused by inadequate power supplies**, could cause "light dimming". In addition supply lines pulled through hard conduits could experience a "buzzing" during this period of high inrush current.

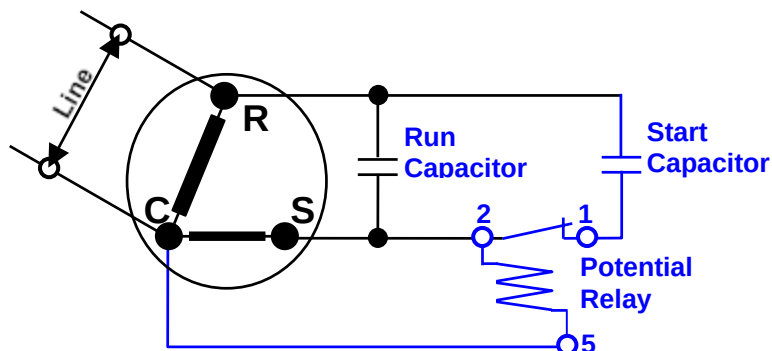
3 Approved start components for scroll compressors

The approved start components listed below will substantially reduce the compressor start time, and the magnitude plus duration of both dimming lights and conduit buzzing.

4 Start kits: start capacitor and potential relay

Start capacitors are used on compressors where system designs require **high starting torque**.

Compressor	Start Kit Including Start Capacitor & Relay	Start capacitor			Potential relay			
Model	Part no.	µFD	Volts	Part no.	Pick-up Volts	Drop-out Volts	Coil Voltage	Part no.
ZR18K4/E PFJ	8541078	88 - 108	330	8035400	170 - 180	40 - 96	332	8035411
ZR22 to 48K3/E PFJ								
ZP23 to 41 K3/E PFJ								
ZB15 to 26 KCE PFJ								
ZH15 to 26 K4E PFJ								
ZB42 KCE PFJ	8542526	270 - 324	330	8018952	320 - 340	60 - 160	502	8035148
ZH30 K4E PFJ								

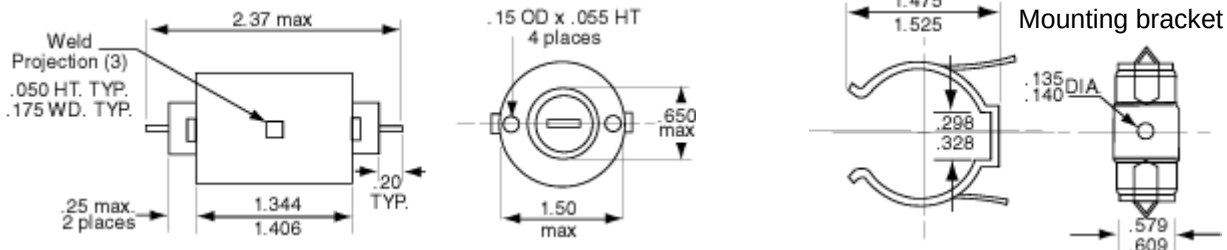


The potential relay places the start capacitor in series with the start winding. It senses the voltage developed across the start winding (C-S). It is designed to pick up, open its contacts and disconnect the start capacitor from the start winding, when sufficient voltage is generated. The relay will open when the motor has started and is approaching normal running speed.

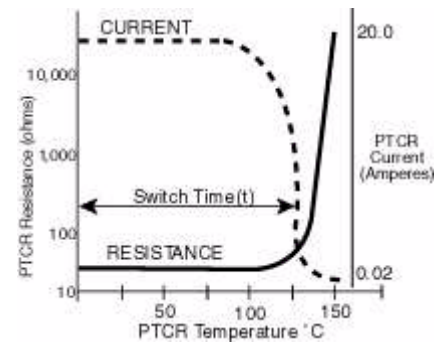
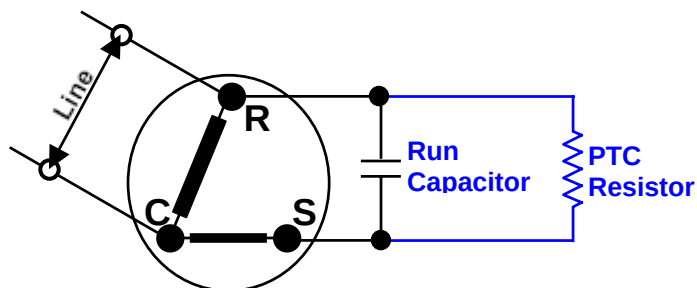
5 PTC start components

For **less severe** voltage drops or for use with a compressor that hesitates on start, solid state **Positive Temperature Coefficient** resistance rated at 25 ohms (Part N° 8400057 including the mounting bracket) may be used to facilitate the starting process for any of the compressors listed above.

Dimensions of the PTC and its mounting bracket (inches)

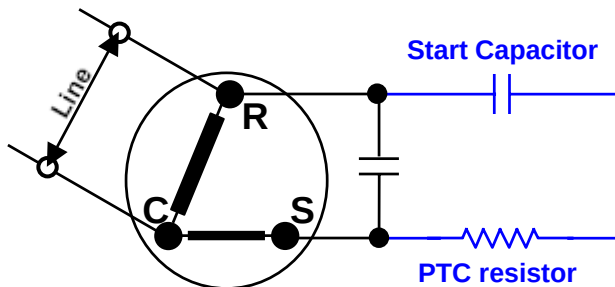


The PTC resistor is connected in parallel with the run capacitor.



6 PTC start components + start capacitor

If it is found that the compressor fails to start with the PTC device, a start capacitor (as specified above) may be fitted in series with the PTC device.



7 ESS-255 Smart Starter from ALCO

The ESS-255 Smart Starter from ALCO can be used in order to limit the starting current of single phase compressors in refrigeration and air-conditioning applications (see Alco documentation)

Reminder about Run Capacitors (not included in the start kit, can be ordered separately)

Compressor Model				Run Capacitor		
				µFD	Volts	Part no.
ZR18K4/E				35	370 V	8540575
ZR22K3/E	ZP23K3E	ZB15KCE	ZH15K4E	40	370 V	8540586
ZR28K3/E	ZP26K3E	ZB19KCE	ZH19K4E	45	370 V	8540597
ZR34K3/E	ZP32K3E	ZB21KCE	ZH21K4E	50	370 V	8540600
ZR40K3/E				55	370 V	8540611
ZR48K3/E	ZP41K3E	ZB26KCE	ZH26K4E	60	370 V	8540622
		ZB42KCE		50	440 V	8015839
			ZH30K4E	45	440 V	8027063