

COPELAND **ZT Scroll CO2** **Compressors**



COPELAND ZT Scroll CO2 Compressors Installation Guide

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COPELAND ZT Scroll CO2 Compressors



Product Information

Specifications

- **Product Name:** Copeland ZT/ZL Scroll CO2 Compressors
- **Manufacturer:** Copeland
- **Model:** ZT and ZL

Product Usage Instructions

Installation of Top Cap Crankcase Heater

Follow the guidelines for implementation provided by the manufacturer:

1. Install the top cap crankcase heater on the weld seam between the compressor top cap and body.
2. Ensure to use of thermal conductive paste between the heater and the compressor for proper heat transfer.

Positioning of Top Cap Heater and Temperature Sensor

Proper positioning of the top cap heater and temperature sensor is crucial for efficient operation:

- **Top Cap Heater:** Position the heater below the discharge port, ensuring the unheated part of the heater metal hose clamp is located above the welding knob.
- **Temperature Sensor:** Install the sensor at the bottom of the discharge port with proper contact and heat transfer using thermal conductive paste and Kapton band for fixation.

Integration with System Controller

Connect each sensor to an analog input terminal of the main system controller. Configure the settings for the top cap heater as specified for auxiliary relay 4.

FAQ (Frequently Asked Questions)

• **Q: What should I do if the compressor has delayed compression at start-up?**

A: In case of delayed compression, it is advised to install a crankcase heater on the top cap as per manufacturer guidelines to optimize sealing for all compressor starts.

• **Q: How do I ensure proper positioning of the temperature sensor?**

A: Follow the installation instructions provided, ensuring that the sensor has direct contact with the discharge port and using thermal conductive paste for heat transfer.

Statements about top cap heater

- In some circumstances it has been observed that ZT and ZL scroll CO2 compressors have delayed compression at start-up.
- In case of “cold” start, it can take longer to heat the top of the compressor to reach the optimum temperature range for the internal seal.
- To reduce this small risk of not achieving an immediate start, it is advised to install a crankcase heater on the top cap.
- This heater ensures the correct temperature at the top of the compressor to achieve optimized sealing for all compressor starts.
- The top cap heating solution has been extensively tested and validated by Copeland. The compressor remains reliable and conforms to all of Copeland’s specifications and standards.
- Copeland’s engineering teams are working on an alternative solution that will remove the need for this heater in the near future.

These statements are valid for the following compressor models:

- ZTW**AG-4X9-*** ZTI**AG-TFD-***
- ZLV**AG-4X9-*** ZL**AG-TFD-***

Guidelines for implementation

The additional top cap crankcase heater shall be installed as shown in Figure 1 below. The heater must be located on the weld seam between compressor top cap and compressor body. The top cap heater must be regulated by a temperature sensor connected to the main rack / unit controller. A temperature sensor measures the temperature on the compressor discharge port. Using an auxiliary relay on the XC Pro system controller, the top cap heater will ensure that the temperature does not fall under 50 °C.

NOTE: Use thermal conductive paste between the heater and the compressor (not shown in Figure 1).

Positioning of the top cap heater

1. Below the discharge port are the start and end points of the weld seam. A small welding knob is perceptible there (yellow arrow 1). The unheated part of the heater metal hose clamp should be located above the small knob.
2. The loose end of the hose clamp should be arranged as shown below (yellow arrow 2). Bending the clamp end at 180° will keep it close to the crankcase heater / compressor body and there will be no risk for it to damage the heater cable due to vibration.

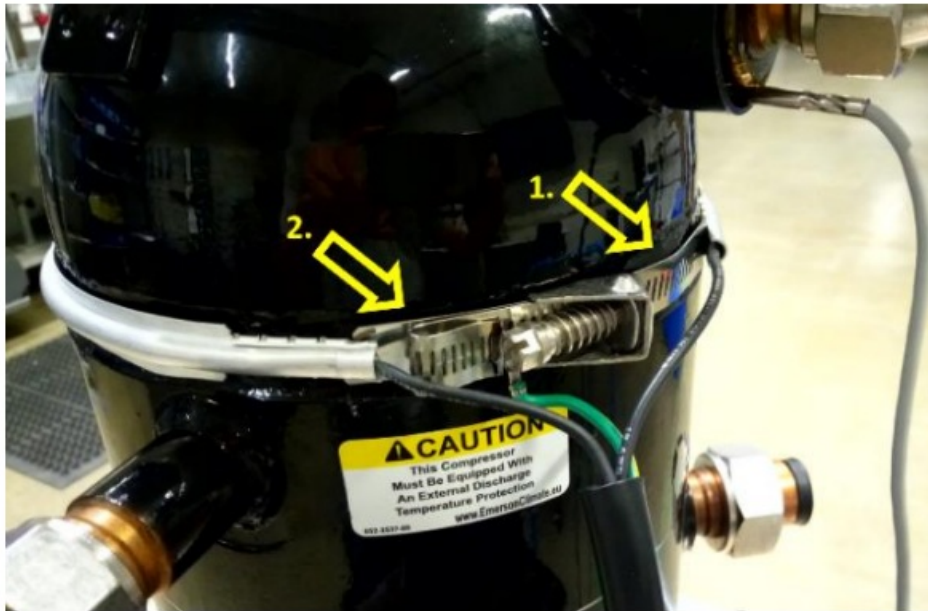


Figure 1: Top cap heater installed on compressor

Positioning of the temperature sensor

The temperature sensor must be installed on the bottom of the discharge port of the compressor. Thermal conductive paste must be used to ensure proper heat transfer from the port to the sensor.

1. The top point of the sensor must touch the weld seam between discharge port and compressor top cap.
2. The sensor needs a minimum of 8 mm direct contact to the discharge port. Conductive heat paste must be used to provide proper heat transfer.
3. The use of KAPTON-band is strongly recommended to fix the probe. With Kapton-band, a linear contact between sensor and port is ensured.

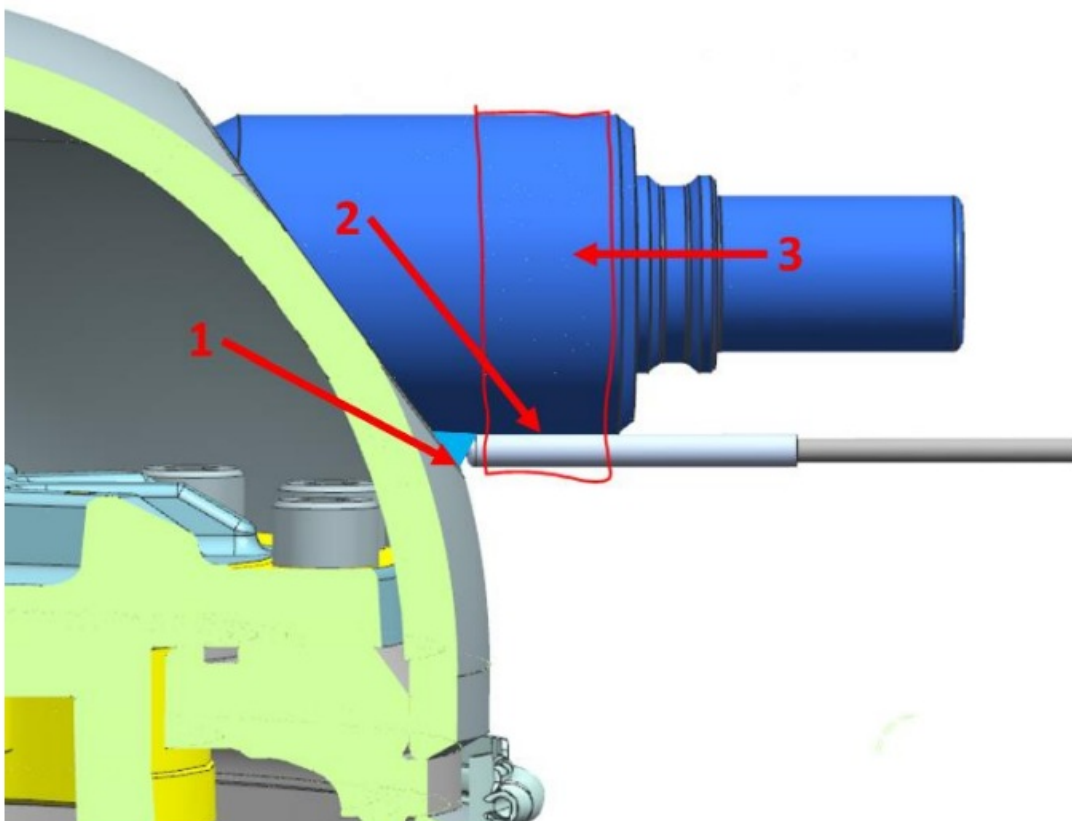


Figure 2: Sensor installation on discharge port

4. Finally, use a spring clamp to ensure long-term fixation of the sensor. Mount the clamp carefully as per Figure 3. The probe should be pressed against the discharge port by the full clamp width.

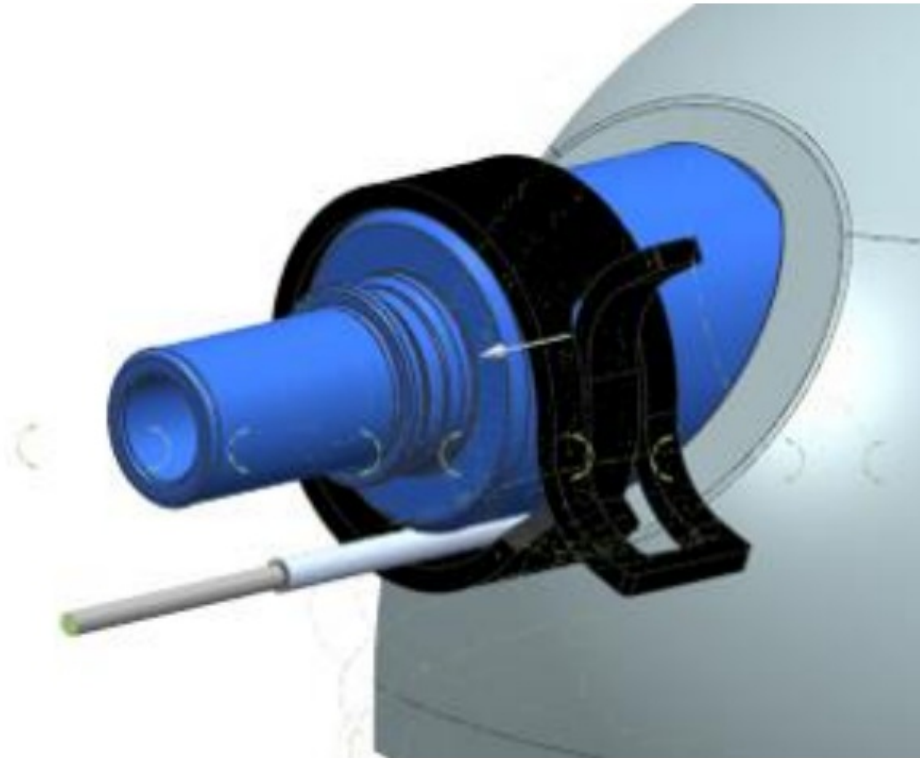


Figure 3: Clamp for sensor fixation

Integration with system controller

Each sensor needs to be connected to an analog input terminal of the main system controller. The parameter setting for the analog input is for instance:

AIC9	Configuration Analog Input 9	26 - PTC Temperature probe Thermostat Aux4
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In this example analog input 9 is configured as Thermostat for auxiliary output # 4. Therefore the settings for the top cap heater must be specified for “aux relay 4”:

AR10	Set point aux relay 4	51.0
AR11	Differential for aux relay 4	0.5
AR12	Kind of action for aux 4	Ht

- AR12 specifies “heating” for auxiliary relay 4.
- Cut-in for the crankcase heater is AR10 – AR11 (50.5 °C in this example).
- Cut-out when temperature reaches setpoint AR10 (51 °C).

At this point, the temperature probe is available and the proper function is allocated. Finally a Digital Output needs to be configured accordingly, in our example DOC2:

DOC2	Configuration Digital Output 2	c97 - Auxiliary output 4
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NOTE: The top cap heater has a 230 V / 1~ / 50 Hz power supply, capacity 70 W. The system controller cannot switch the crankcase heater directly. An additional relay must be used.


In larger systems, it is possible that not enough I/O's are available. In this case, extension modules have to be used to provide enough I/O's. For the XC Pro 315, extension modules IPX206 and IPX215 are available from

Copeland.

- **Heater:** 230 V / 1~ / 50 Hz; 70 W; Ident # on request from Application Engineering department.
- **Sensor:** PTC sensor; -50 °C <> +150 °C; Ident # on request from Application Engineering department.
- Kapton-tape, clamp and conductive heat paste are not part of the Copeland offer.

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Documents / Resources



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References

- [User Manual](#)

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