

Incident Summary #II-1503013-2023 (#31232) (FINAL)

SUPPORTING INFORMATION	Incident Date	January 31, 2023	
	Location	Vancouver, BC	
	Regulated industry sector	Electrical - Low voltage electrical system (30V to 750V)	
	Impact	Qty injuries	0
		Injury description	N/A
		Injury rating	None
	Damage	Damage description	Electrical baseboard low voltage relay overheated causing smoke and fire.
		Damage rating	Minor
Incident rating	Minor		
Incident overview	A low voltage electronic relay installed in a baseboard heater junction box overheated, failed, and caused a small fire that damaged the relay and associated wiring.		
INVESTIGATION CONCLUSIONS	Site, system and components	<p>The AUBE low voltage (24v) programable thermostat, part #TH140A-28 located on the wall of the student housing concrete tower foyer, provides a voltage that opens or closes the RE153 STELPRO low voltage 15AMP @ 120v-347v electronic relay located in the 1000W baseboard heater. In this installation the low voltage thermostat controls six 1000W baseboards. Each baseboard has its own RE153 low voltage electronic relay located in the baseboard. One 15AMP 208v 2pole breaker supplies power for two 1000W baseboards.</p> <p>It is recommended by the Manufacturer specifications that no more than 4 low voltage relays be installed per thermostat and that the thermostat part number be one that is listed compatible by the manufacture's specifications sheet. (Photo #4).</p>	
	Failure scenario(s)	<p>The Field Service Representative was notified of a small fire and smoke coming out of the STELPRO 1000W baseboard heater located in Building #3 front desk area (Photo #1). Upon arrival the FSR met the fire department that had arrived on site.</p> <p>The smoke had initiated the smoke detectors in the building. The 1ft tall flame that was reported by the front desk attendant, had extinguished itself. The FSR found that all 2pole 15AMP breakers were still engaged. The FSR manually opened all breakers to the six 1000W baseboard heaters. The low voltage relay is not compatible with the installed thermostat and there were more than 4 relays connected to one thermostat.</p>	
	Facts and evidence	<ul style="list-style-type: none"> The FSR removed all Baseboard covers to access the RE153 low voltage relays. The FSR also removed the AUBE low voltage thermostats. <p><u>Visual inspection of all 1000W baseboards & AUBE thermostats showed.</u></p> <ul style="list-style-type: none"> The damage was highly localized and confined to the RE153 STELPRO low voltage electronic relay. (Photo #2) 	

Incident Summary #II-1503013-2023 (#31232) (FINAL)

- Manufacturers specifications were not followed. More than 4 low voltage relays on one thermostat and the thermostat part number not listed as compatible with the low voltage relay. ([Photo #4](#))
- An additional damaged RE153 STELPRO was discovered on a different 15AMP 2pole circuit and on a different thermostat. The thermostat was connected to more than 4 low voltage relays and the thermostat part number not listed as compatible with the low voltage relay. ([Photo #4](#)).
- Two AUBE low voltage thermostats discovered to be faulty. Thermostat always in the Normally closed position.

Statements from the FSR indicated the following:

- The 15AMP 2pole circuit breaker did not trip during the event.
- After doing a full review of all baseboards and thermostats in the foyer area the FSR and his team discovered a RE153 STELPRO low voltage relay that was damaged. The FSR or his team are unaware of a previous incident that would account for this additional damaged low voltage relay. This relay is connected to an additional 15AMP 2pole circuit.

Statement from manufacturer technical support:

- The thermostat part numbers indicated on manufacturer specification sheet ([Photo #4](#)) are the only thermostats that manufacturer tested the compatibility with the low voltage relay.

Causes and contributing factors

The cause of the relay overheating and catching fire was very likely due to the relay not being installed as per the manufacturer's specifications. This includes the relay not being installed with a thermostat deemed compatible by the manufacturer and that there were more than four low voltage relays connected to one thermostat.

Contributing factors include:

- The thermostat failing into a closed or continuously powered state possibly contributed to the heat at the relay.



Photo #1

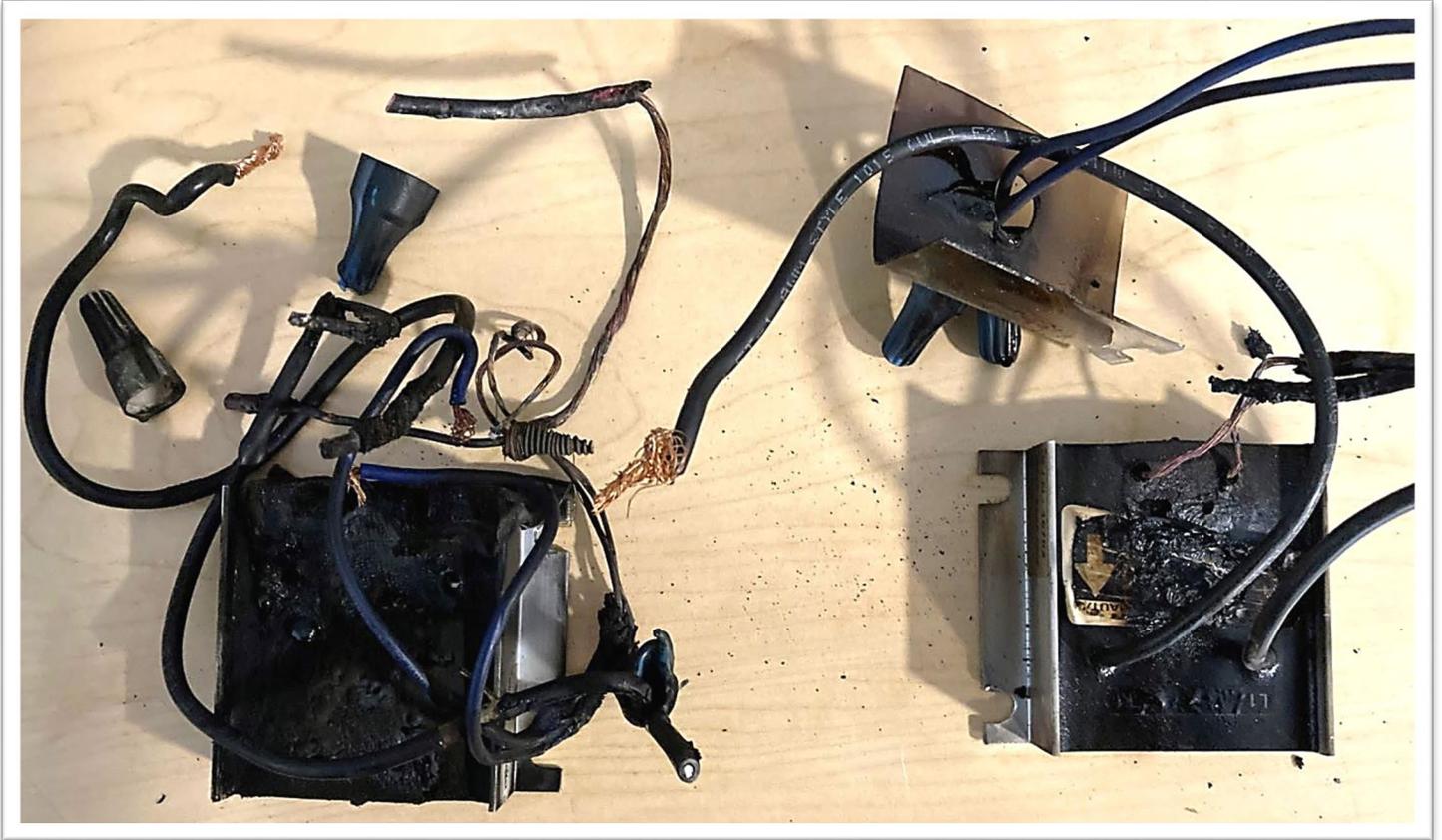


Photo #2



Photo #3

RE15

ELECTRONIC RELAY – LOW VOLTAGE – SMALLER-SIZED

CONTROL

- pulsed signal (PWM) or all or nothing (on/off) at 24 Vac, 3-32 Vdc signal
- with a transformer (RE153T)
- compatible with the STE241, T822K1034, T87K1015, D010 and ET180 thermostats
- two additional relays without transformers can be added to the same control circuit as a relay with a transformer
- installing more than four relays without transformers to the same thermostat is not recommended

INSTALLATION

- the relays must be installed inside the junction box of the heating unit

WARRANTY

- three years



RE153

PRODUCT	DESCRIPTION	PRICE
RE153	ELECTRONIC LOW VOLTAGE RELAY [15 A @ 120 V-347 V]	

Dimensions: RE153 and RE156: 3.31 in. x 2.17 in. x 0.89 in. (84.1 mm x 55.1 mm x 22.6 mm) / RE153T: 3.31 in. x 2.17 in. x 1.5 in. (84.1 mm x 55.1 mm x 38.1 mm)



FC_RE25-RE30-RE15_EN_150722

°STELPRO

Stelpro reserves the right to modify descriptions, manufacturing specifications or prices without prior notice. No returns accepted on optional-colour products.

For all the latest models and prices, please refer to our website at www.stelpro.com.

Photo #4