



Application Note 3028 Televac® Simulators

1 Scope

1.1 Purpose

Simulators mimic the electrical signal from a typical vacuum gauge at various vacuum levels/pressures. Their most common use is troubleshooting vacuum systems and identifying potential setup issues. This document outlines simulators offered by Televac and how they can be used.

2 Simulator Types

2.1 Preset Simulators

Televac offers simulators for many of our most popular vacuum sensors. These simulators come in two different types:

1. Zero point simulators simulate a typical vacuum gauge output at 0 microns/mTorr.
2. Multi-point simulators simulate a typical vacuum gauge output at multiple pressures.

Available simulators are listed below:

Sensor Model	Simulated Pressures	Part Numbers
2A Thermocouple	Zero (red line, 0 microns)	2-2100-237
	3 point (0, 100, 1000 microns)	2-2100-242
2A Mini Thermocouple	Zero (red line, 0 microns)	2-2100-240
	3 point (0, 100, 1000 microns)	2-2100-241
4A Convection	Zero (red line, 0 microns)	2-2119-000
	3 point (0, 1, 760 Torr)	2-2119-003
7B Penning Magnetron	2 point (10^{-3} , 10^{-5} Torr)	2-2100-93
	4 point (10^{-3} , 10^{-4} , 10^{-5} , 10^{-6} Torr)	2-2100-108
7E Double Inverted Magnetron	2 point (10^{-2} , 10^{-5} Torr)	2-2142-000
7F Double Inverted Magnetron	2 point (10^{-3} , 10^{-5} Torr)	2-2145-000

2.2 Custom Simulators

Simulators for custom pressures are also available. These simulators allow you to set the pressure to anything within their range, see below:

Sensor Model	Simulated Pressure Range	Part Number(s)
2A Thermocouple	1 to 30 microns	6-2100-237
	31 to 180 microns	6-2100-243
	181 to 1000 microns	6-2100-245
2A Mini Thermocouple	1 to 30 microns	6-2100-240
	31 to 180 microns	6-2100-244
	181 to 1000 microns	6-2100-246
4A Convection	One point (customer specified)	6-2119-000

3 Using Simulators to Troubleshoot

If the vacuum readings on your Televac controller are incorrect, it can be challenging to determine which part of the setup is causing the issue. Several troubleshooting methods are described below:

1. Because a simulator represents the electrical signal from a typical vacuum gauge, it can be used to test whether the vacuum gauge is causing the problem. To test this, replace the vacuum gauge with a simulator and see if the outputs from the controller are within a reasonable tolerance. If they aren't, the gauge may need to be replaced.
2. Almost all of our cold cathode gauges can be cleaned, which may fix any issues with those gauges. See [Application Note 3002 \(7B and 7E\)](#) and [Application Note 3004 \(7FC and 7FCS\)](#) for more information and the cleaning procedure.
3. If replacing the gauge doesn't fix the problem, a simulator can also be used to test other system components without pulling vacuum. For example, a different cable can be tested by using it with the simulator to see if it fixes the problematic readings.

4 A Note on Using Simulators For Calibration

Calibration is a common step in the set up of a vacuum controller. It ensures that the controller readings with a corresponding vacuum gauge are in tolerance. Simulators don't account for gauge to gauge variation because a simulator is representative of a typical vacuum gauge. Therefore, calibrating with a simulator can cause incorrect readings when a vacuum gauge is connected. Because of this, **Televac does not recommend attempting to calibrate a vacuum controller using a simulator.**

For more information on Televac's recommended practices for field calibration of vacuum systems, please see [Application Note 3015](#).

5 Contact Us

Please feel free to contact us with any questions:

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