



## **B2A Portable Thermocouple Controller Instruction Manual**



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# 1 Introduction

## 1.1 Disclaimer

All information in this manual is subject to change without notice. The Fredericks Company assumes no responsibility for inaccuracies in product specifications or any liability arising from product use. Please contact Televac at [sales@televac.com](mailto:sales@televac.com) or call 215-947-2500 with comments or questions.

## 1.2 Description

The B2A Portable is a thermocouple vacuum sensor controller with a range of  $1 \times 10^{-3}$  Torr to 20 Torr. It utilizes a Televac thermocouple vacuum sensor, part number 2-2100-10 or 2-2126-0YY. It has an easy-to-read analog display that indicates pressure in units of mTorr.

## 1.3 Operating Specifications

Table 1: Operating Specifications

|                                    |                                 |
|------------------------------------|---------------------------------|
| <b>Operating Range</b>             | 1 × 10 <sup>-3</sup> to 20 Torr |
| <b>Communications</b>              | N/A                             |
| <b>Programmable Set Points</b>     | N/A                             |
| <b>Analog Output</b>               | N/A                             |
| <b>Supply Voltage for Charging</b> | 90 V to 135 V AC, 60 Hz         |
| <b>Calibration Medium</b>          | Dry air or nitrogen             |
| <b>Overpressure</b>                | Sensor-dependent                |
| <b>Battery Life</b>                | 12 hours                        |
| <b>Charging Time</b>               | 15 hours                        |
| <b>Operating Temperature</b>       | 0° C to 50° C                   |
| <b>Storage Temperature</b>         | -20° C to 60° C                 |
| <b>Bakeout Temperature</b>         | Sensor-dependent                |
| <b>Response Time</b>               | ≤ 1 second                      |
| <b>Accuracy</b>                    |                                 |
| <b>1 mTorr to 10 mTorr</b>         | ±1 mTorr                        |
| <b>10 mTorr to 500 mTorr</b>       | ±10%                            |
| <b>500 mTorr to 1 Torr</b>         | ±20%                            |
| <b>Display Readable Distance</b>   | 1 m (3 feet)                    |

## 1.4 Safety Information

### START BY READING THESE IMPORTANT SAFETY INSTRUCTIONS AND NOTES

In these instructions the word “product” refers to the B2A Portable and all of its approved parts and accessories. NOTE: These instructions do not and cannot provide for every contingency that may arise in connection with the installation, operation, or maintenance of this product. Should you require further assistance, please contact Televac at the email address found in the footer of this manual.

This product has been designed and tested to offer reasonably safe service provided in it is installed, operated and serviced in strict accordance with these safety instructions.

These safety precautions must be observed during all phases of operation, installation, and service of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. Televac disclaims all liability for the customer’s failure to comply with these requirements.

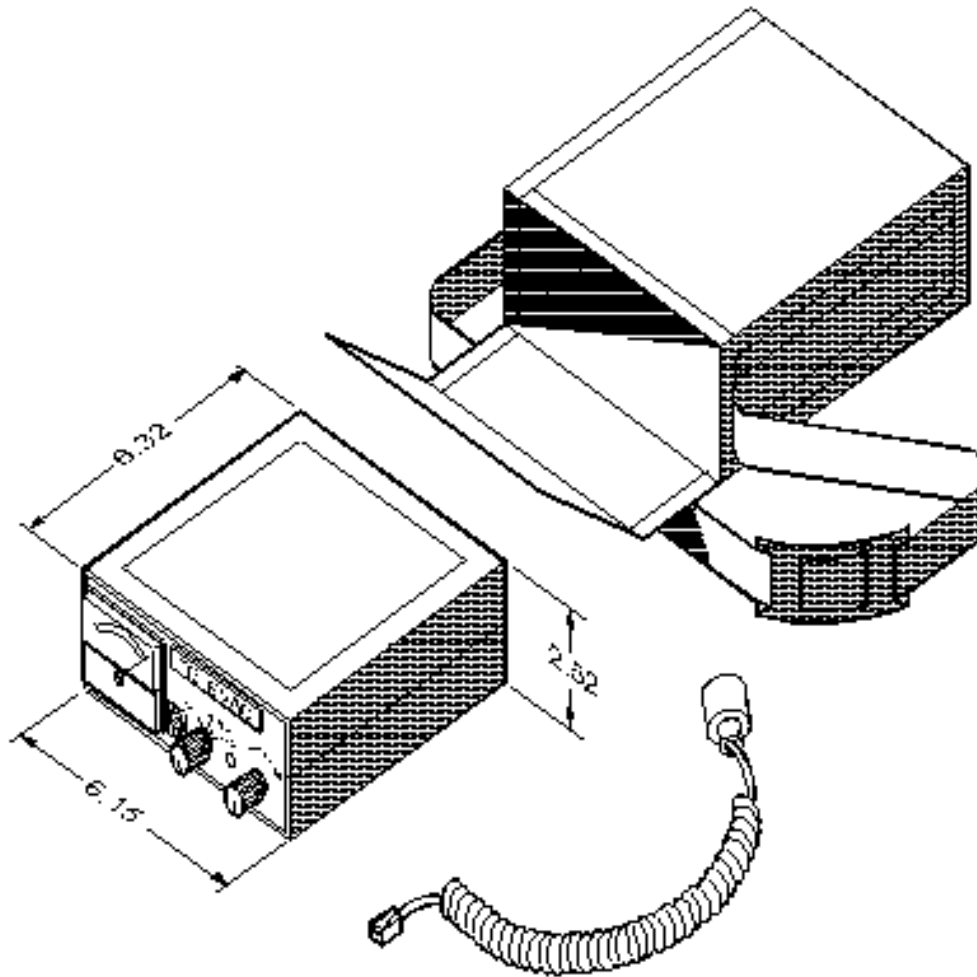
- READ instructions – Read all safety and operating instructions before operating the product.
- RETAIN instructions – Retain the Safety and Operating Instructions for future reference.
- HEED warnings – Adhere to all warnings on the product and in the operating instructions.
- FOLLOW instructions – Follow all operating and maintenance instructions.
- ACCESSORIES – Do not use accessories not recommended in this manual as they may require a technician to restore the product to its normal operation.

The B2A Portable qualifies as a Safety Extra-Low Voltage (SELV) device. As such, it represents little to no hazard concerning electrical shock or burns.

**Do not substitute parts or modify instrument. Because of the danger on introducing additional hazards, do not install substitute parts or perform any unauthorized modifications to the product. Return the product to Televac for service and repair to ensure that safety features are maintained. Do not use this product if it has unauthorized modifications**

### 1.5 Dimensions

Figure 1: B2A Portable Dimensional Drawing (inches)



## 2 Setup

### 2.1 Installation

Each B2A Portable is designed to be used in conjunction with a 2A Thermocouple sensor. The 2A sensor can be mounted in any orientation. The sensor should be mounted close to the area where vacuum measurement is desired. Each 2A sensor has a key that only allows the sensor end of the B2A Portable cable to mate with the sensor in the proper orientation. Rotate the sensor end of the B2A Portable cable until the correct alignment is obtained and the B2A Portable cable is able to slide onto the 2A sensor. Connect the RJ14 end of the B2A Portable cable into the port on the front of the B2A Portable. To take a reading using the B2A Portable, turn the left knob on the front of the unit to the "READ" position. When done taking a reading, turn the knob to the "OFF" position.

Try to avoid connecting the 2A sensor to the vacuum chamber by long or narrow piping as this may affect the accuracy and response time of the unit. Avoid mounting the unit near a heater within the chamber as this may affect the measurement accuracy. Excessive vibration of the sensor may affect accuracy and decrease the life of the sensor. Exposure to oils and other contaminants will decrease the accuracy and decrease the life of the sensor. Do not expose the sensor to corrosive gases.

### 2.2 Calibration

The B2A Portable controller provides a calibration adjustment to maximize the accuracy of each sensor. The adjustment should be set at 1 mTorr. Maximum accuracy will utilize a 2A sensor and a NIST traceable reference gauge co-located on a vacuum chamber. A controlled leak of dry nitrogen is necessary for calibration. All B2A Portable controllers purchased with a 2A sensor will be factory calibrated and there is no need for adjustment.

For calibration, pump the vacuum chamber down to below  $1 \times 10^{-4}$  Torr. Using the leak control on the vacuum system, adjust the pressure in the chamber until the reference gauge reads 1 mTorr. Then adjust the left knob on the front of the unit to the "CAL" position. Then adjust the right knob on the front of the unit until the unit reads 1 mTorr. Change the left knob to OFF or READ to resume normal operation.

### 2.3 Charging

The B2A Portable is equipped with a NiCd rechargeable battery. The AC power cable is not necessary for operating the unit. The battery provides up to 12 hours of use of the unit between charges. The indicator light, located between the two knobs on the front face of the unit, will turn when the unit has less than two hours of battery power remaining.

To charge the unit, connect the AC power cable in the rear of the unit and adjust the left knob on the front of the unit to the "CHG" position. In this position, the unit will charge. Note that the unit only charges when the knob is in that position. To ensure a full charge, allow the unit 15 hours to charge.

### 3 Part Numbers

Table 2: Controller, Cable, and Sensor Part Numbers

|   |            |
|---|------------|
| <b>B2A Portable Controller</b>                            | 2-3001-100 |
| <b>2A Sensor 1/8" NPT Nickel-Plated Brass</b>             | 2-2100-10  |
| <b>2A Sensor Stainless Steel 1/8" NPT</b>                 | 2-2126-001 |
| <b>2A Sensor Stainless Steel NW16 (DN16 ISO-KF)</b>       | 2-2126-030 |
| <b>2A Sensor Stainless Steel NW25 (DN25 ISO-KF)</b>       | 2-2126-031 |
| <b>2A Sensor Stainless Steel 8-VCO Male</b>               | 2-2126-040 |
| <b>2A Sensor Stainless Steel 8-VCO Female</b>             | 2-2126-041 |
| <b>2A Sensor Stainless Steel 8-VCR Male</b>               | 2-2126-042 |
| <b>2A Sensor Stainless Steel 8-VCR Female</b>             | 2-2126-043 |
| <b>2A Sensor Stainless Steel 4-VCR Male</b>               | 2-2126-044 |
| <b>2A Sensor Stainless Steel 4-VCR Female</b>             | 2-2126-045 |
| <b>2A Sensor Stainless Steel 1.33" CF (DN16 ISO-CF-F)</b> | 2-2126-050 |
| <b>2A Sensor Stainless Steel 2.75" CF (DN40 ISO-CF-F)</b> | 2-2126-052 |
| <b>3 ft Cable</b>   | 2-9800-076 |
| <b>10 ft Cable</b>  | 2-9800-077 |
| <b>20 ft Cable</b>  | 2-9800-078 |
| <b>35 ft Cable</b>  | 2-9800-079 |
| <b>50 ft Cable</b>  | 2-9800-080 |
| <b>35 ft Cable</b>  | 2-9800-079 |
| <b>2A Mini Coiled 10 ft Cable</b>                         | 2-9800-082 |
| <b>2A Mini Flat 10 ft Cable</b>                           | 2-2100-084 |
| <b>NASA 2A Miniature Sensor</b>                           | 2-2100-31  |

Contact Fredericks Company for further sensor flange types and cable lengths.