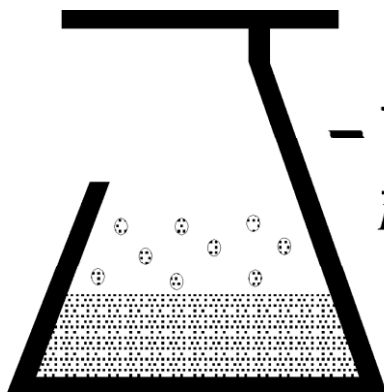# Temperature Control for Research and Industry

Digital Vacuum Monitor

User's Manual
Model 120

J-KEM Scientific, Inc.

Instruments for Science from Scientists

Warranty

J-KEM Scientific, Inc. warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of 6 months from date of purchase. If the unit should malfunction, it must be returned to the factory for evaluation.   If the unit is found to be defective upon examination by J-KEM, it will be repaired or replaced at no charge. However, this WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive vibration, corrosive materials, or misuse. Components which wear or are damaged by misuse are not warranted. This includes valves and fuses.

THERE ARE NO WARRANTIES EXCEPT AS STATED HEREIN. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL J-KEM SCIENTIFIC, INC. BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES. THE BUYER'S SOLE REMEDY FOR ANY BREACH OF THIS AGREEMENT BY J-KEM SCIENTIFIC, INC. OR ANY BREACH OF ANY WARRANTY BY J-KEM SCIENTIFIC, INC. SHALL NOT EXCEED THE PURCHASE PRICE PAID BY THE PURCHASER TO J-KEM SCIENTIFIC, INC. FOR THE UNIT OR UNITS OF EQUIPMENT DIRECTLY AFFECTED BY SUCH BREACH.

Returns, requests for service and inquires should be directed to:

> J-KEM Scientific, Inc.
> 6970 Olive Blvd.
> St. Louis, MO 63130
> (314) 863-5536
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> E-mail: jkem911@jkem.com

Section 1   Quick Operating Instructions

The only mechanical setup step for the vacuum monitor is to connect the stainless steel tubing (vacuum sensor) to the instrument that vacuum is being monitored in.   When power is applied to the monitor, it continuously shows the sensed pressure at the vacuum sensor input.

The controls highlighted in blue, are not active on a vacuum monitor, but are only active on the vacuum controller.

When power is applied to the monitor, the digital meter continuously shows the sensed pressure of the vacuum port (stainless steel tubing on the back of the controller).
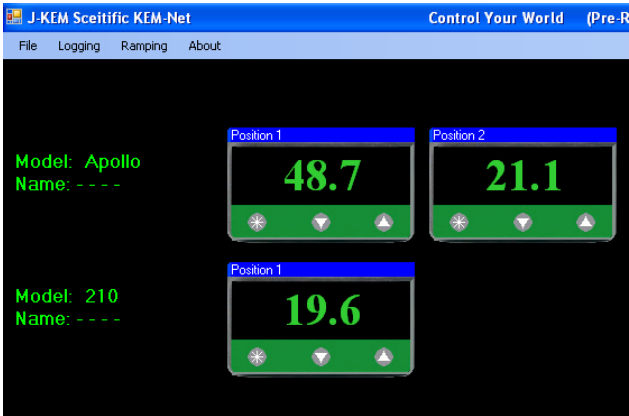

These controls are not active on a Vacuum Monitor

KEM-Net Data Logging and Control Software

In 2008, J-KEM completed a redesign of it's research grade controllers.   The redesign involved both the hardware running your controller and software for remote control and data logging.

Hardware –   The regulator may look the same, but inside is our 3rd generation microcontroller.   This controller is FLASH programmable and capable of downloading *program modules*(software) from our web site at no charge.   Several program modules are in development, but the most exciting is a module that automatically reports exothermic reactions – even during the heating phase of a reaction when an exotherm would normally be undetectable.

Software -   Your regulator is equipped with a USB port to allow remote control and data logging.   J-KEM's KEM-Net is allows up to 16 controllers to be operated from a single PC with data logging, multi-step temperature ramps, software high and low temperature safety alarms and many other features.

| KEM-Log implements:

   * Data logging directly to Excel or a text file.

   * A 16-step temperature ramp that's constructed in an Excel-like table.

   * Easy entry of the setpoint

   * High and Low Safety temperature alarms | |

KEM-Net is free of charge and can be downloaded from J-KEM's web site.

1. Go to J-KEM's web site at http:\\www.jkem.com, then click on the Download Software link at the bottom of the home page.   From the list of software downloads, click on KEM-Net.   A popup window appears presenting the options of RUN, SAVE and CANCEL.   Selecting the SAVE option brings up a Save File Dialog window.   Save the file kemnetzip.exe to your C drive, then exit your web browser.
2. Kem-NetZip.exe is a self-extracting zip file.   Double click on its icon to expand it.   Once expanded, kemnetzip.exe creates a new folder on your C drive titled "JKEM" which contains the KEM-Net Installation Project and copies of user's manuals and USB drivers.
3. Print the document titled PrintMe_Now.pdf for instruction on how to install the USB drivers and the KEM-Net software.

The USB port on this controller has a feature that allows communications by means of a *virtual comm port* sending and receiving ASCII string characters.   This feature can be used by programs like LabView and other third party software packages to communicate with the controller.   Instructions for use, and the ASCII command set can be downloaded from J-KEM's web site by clicking on Download Manuals, then selecting the document ASCII Communications With J-KEM Controllers.

Correcting Offset in the Displayed Pressure. A small amount of error can develop in the displayed pressure (≈ 2 torr) of the vacuum regulator. This is due to the wide pressure range of the transducer used and accuracy better than this is usually not possible. For display errors larger than 2mm, the controller can be calibrated using the procedure below (For users experienced with J-KEM's meter, do not correct pressure using the "**ZEro**" function. This introduces an error, not a correction). Before beginning this procedure you will need to know the correct barometric pressure inside your lab.

This procedure should only be performed by a qualified electrician.

1.   Remove the controller's cover.

2.   Let the controller warm up for 30 minutes.

3.   Connect a vacuum pump to the INLET port, turn it on and let it evacuate the controller to as close to 0 torr as possible. Measure the pressure in the system using a manometer. The regulator must be evacuated to as close to 0 torr as possible before the adjustment in step 4 is performed.

4.   Adjust the "**Zero**" pot until the reading on the meter matches the actual pressure.

5.   Turn the vacuum pump off and disconnect it from the monitor. Adjust the "**Span**" pot until the meter reads the actual barometric pressure in the lab.

6..   Turn the controller off and replace the cover.
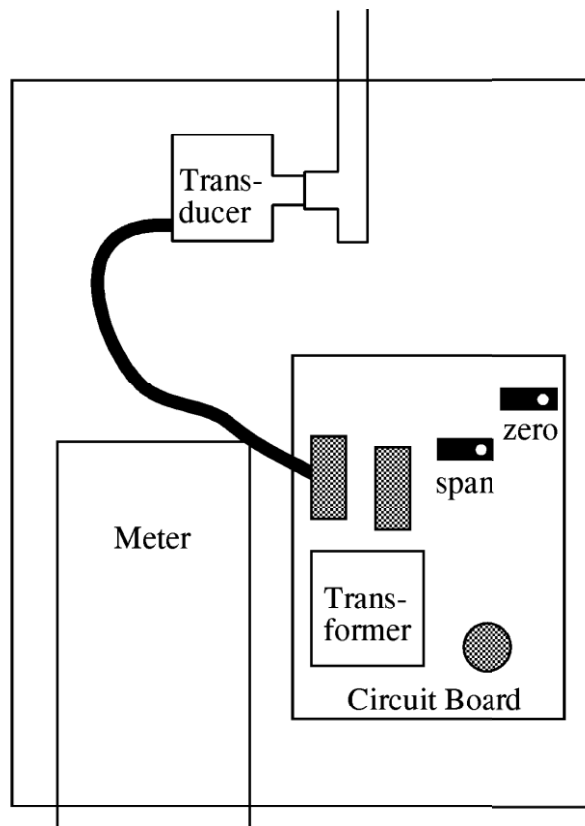
Looking in from the top of the vacuum monitor