

Contents

1 Description

Applicable Products

Description	Part Number
MP2AR	2-7910-XXX
MP4AR	2-7930-XXX
MX7B	2-8940-XXX
MX7M	2-8950-XXX
MP2AR/MP4AR 9 Conductor Cable	2-9852-XXX
MX7B/MX7M 6 Conductor Cable	2-9873-XXX
MX7B/MX7M 15 Conductor Cable	2-9858-XXX

2 How the Automatic Control Works

- 2.1 The Televac® MP2AR and MP4AR are thermal conductivity active vacuum gauges used for rough vacuum measurements from approximately 1×10^{-3} Torr to 20/760 Torr.

The Televac® MX7B and MX7M are cold cathode active vacuum gauges used for high and ultra-high vacuum measurements from approximately 1×10^{-11} / 1×10^{-8} Torr to 1×10^{-2} Torr.

Cold cathode gauges should not be operated at pressures above approximately 1×10^{-2} Torr. Operating the cold cathode at higher pressures can increase sputtering, oxidation, and contamination, which may lead to inaccurate readings and damage to the vacuum gauge.

- 2.2 The MP2AR and MP4AR include a **relay set point** that can be configured to switch at a specific vacuum pressure.

For this application, the relay set point is configured near 1×10^{-2} Torr and used to control the Pin Control input of the MX7B or MX7M. This allows the MP2AR/MP4AR to automatically **enable** the cold cathode as pressure decreases and **disable** it as pressure increases.

This creates a standalone active vacuum gauge system in which the MP2AR/MP4AR measures rough vacuum and controls the cold cathode, while the MX7B/MX7M measures high and ultra-high vacuum. The combined system can cover the pressure range from approximately 1×10^{-11} / 1×10^{-8} Torr to 20/760 Torr.

3 Configure MP2AR/MP4AR Set Point

- 3.1 The MP2AR and MP4AR include a **relay set point** that can be used to control the MX7B/MX7M cold cathode. For this application, the recommended set point is **10 microns (1×10^{-2} Torr)**. Your vacuum system may require a different setting.

To view the current set point, press the **Setpoint Display** button on top of the MP2AR/MP4AR. The set point pressure will appear on the display.

When the set point is below 1 Torr, the **micron LED** will illuminate. The display will blink while showing the set point value.

To return to normal operation, press the **Setpoint Display** button again or allow the display to return automatically after approximately 60 seconds.

The set point can be monitored as a voltage from **pin 9 of the DB9 connector**. This voltage can be converted to pressure using the method described in the MP2AR/MP4AR manual.

- 3.2 To adjust the MP2AR/MP4AR relay set point:

1. View the current set point using either of the methods described above.
2. Turn the **Setpoint Adjustment** screw to change the set point value.
3. Adjust the set point to **10 microns (1×10^{-2} Torr)**.

4 Enable Pin Control on the MX7B/MX7M

- 4.1 The MX7B/MX7M must be configured for **Pin Control** before it can be automatically enabled and disabled by the MP2AR/MP4AR relay.

To enable Pin Control from the MX7B/MX7M front panel:

1. Press **SEL** two times, then use the **up or down arrows** until **Vsense Control** is displayed.
2. Press **ENT**. **ADJ** will appear at the top of the display.
3. Use the **up and down arrows** to change the setting to **Pin**.
4. Press **ENT** to save the setting. **ADJ** will disappear.
5. Press **SEL** until the measurement screen is displayed or allow the display to return automatically after the timeout.

- 4.2 Pin Control can also be enabled through RS-485 communications using the **W8 command**.

Send: ***XW81<cr>**

Where:

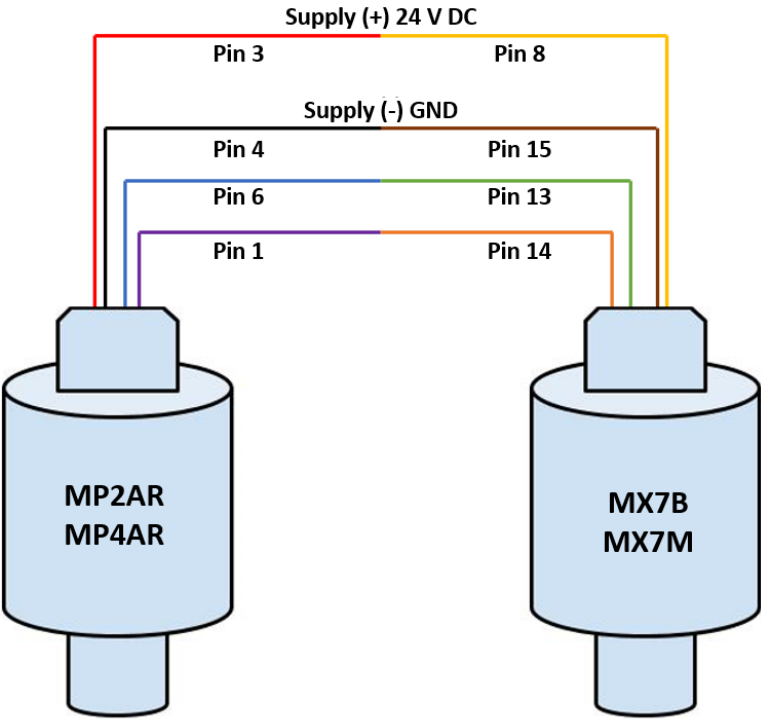
- **X** is the MX7B/MX7M address. The default is 0.
- **<cr>** represents a carriage return which is equivalent to pressing the enter key on your keyboard.

5 Connect the MP2AR/MP4AR to the MX7B/MX7M

5.1 The MX7B/MX7M Pin Control input is controlled by pins 13 and 14. When these pins are shorted together, the cold cathode is enabled. When the connection is open, the cold cathode is disabled.

The MP2AR/MP4AR relay connects pin 6 (Relay COM) to pin 1 (Relay NO) when the pressure is below the configured set point. This relay connection can therefore be used to control the MX7B/MX7M Pin Control input.

MP2AR/MP4AR	MX7B/MX7M	Description
Pin 6 (Relay COM)	Pin 13	Relay common connection
Pin 1 (Relay NO)	Pin 14	Relay normally open connection



- 5.2 During pumpdown, when the pressure falls below the configured set point of approximately **$1 \cdot 10^{-2}$ Torr (10 microns)**, the MP2AR/MP4AR relay connects pins 6 and 1. This shorts MX7B/MX7M pins 13 and 14 and enables the cold cathode.

When the pressure rises above the configured set point, the relay changes state and the connection between MX7B/MX7M pins 13 and 14 opens, disabling the cold cathode.

- 5.3 Power must be supplied to both the MP2AR/MP4AR and MX7B/MX7M.

Depending on the application, additional connections may also be required, including:

1. **Analog output connections** to a PLC or other control system.
2. **RS-485 connections** to a PLC or other control system.

6 Contact Us

Please feel free to contact us with any questions:

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