4–20 mA Wiring for Controllers

Application Guide

Contents

KMC Controllers and 4–20 mA Inputs/Outputs

KMC Conquest **BAC-59xx/90xx/93xx** controllers, the **BAC-A1616BC** Building Controller, and the **KMD-5220** (input module for the LAN Controller) can **natively read a 4–20 mA** signal on their input terminals (after proper configuration via a jumper or software).

Older KMC controllers **require an external 250 ohm** (or more readily available 249 ohm) **resistor wired across the input and ground terminals**. (See **Accessories on page 4**.) The resistor converts the mA signal into a voltage signal that the controller can recognize. The controller's physical input is then set (via jumpers or switches) for an active voltage sensor, and software configures the internal functioning for 4-20 mA. (See the controller's installation guide and software help information.)

The external **250 ohm resistor** shown in **Input Wiring on page 2** are **to be used with the following controllers**:

- BAC-10xxx/12xxxx/13xxxx/14xxxx FlexStats*
- BAC-58xx and KMD-58xx
- BAC-7xxx and KMD-7xxx
- Older KMDigital controllers

***NOTE:** To ensure accurate readings from the internal temperature sensor of a FlexStat, do not mount the 250 ohm resistor inside the FlexStat's case.

To get a 4–20 mA **output** from a (compatible) KMC controller, use an **HPO-6704** output override board. Alternately, an **REE-2005** voltage-to-current converter module can convert a 0–10 VDC output signal from any controller into a 0–20 mA output signal. See **Output Wiring on page 3** and **Accessories on page 4**.

Input Wiring

***NOTE:** A resistor is internally supplied with newer KMC controllers (see **KMC Controllers and 4–20 mA Inputs/Outputs on page 1**). An external resistor must be supplied for other controllers (see **Accessories on page 4**).

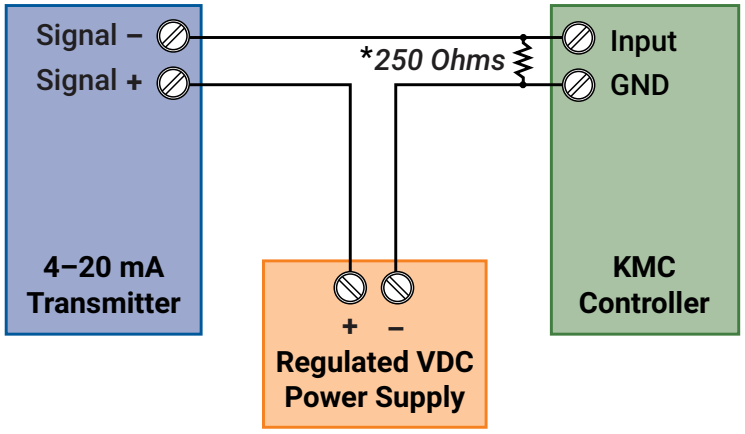

Illustration: Two-Wire Loop Powered

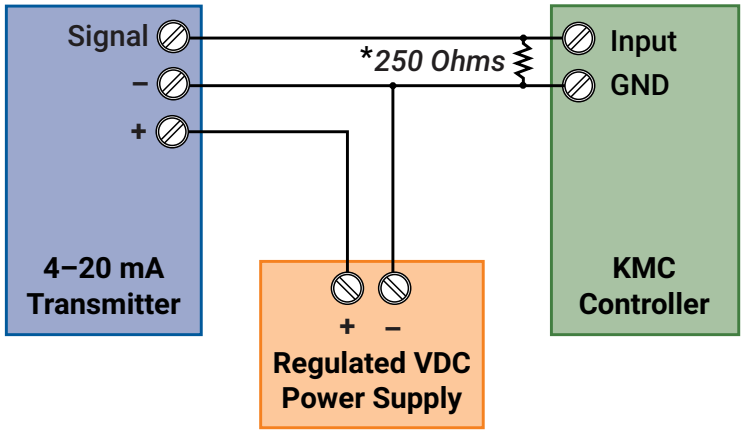

Illustration: Three-Wire

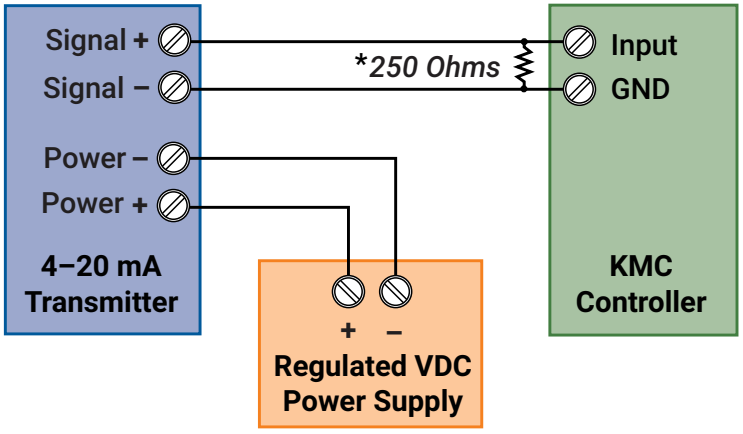

Illustration: Four-Wire

Output Wiring

For a 4–20 mA **output** from a (compatible) KMC controller, use an **HPO-6704** output override board in the provided slot for the output. The HPO-6704 converts a 0–10 VDC output signal in the controller to a 4–20 mA output. Compatible controllers include:

- BAC-A1616BC
- BAC-59xx
- BAC-58xx and KMD-58xx
- KMD-52xx

NOTE: The controller and HPO-6704 board supply the power to the 4–20 mA output circuit. No external regulated power supply is used in that circuit. See **Illustration: HPO-6704 Installed in Compatible KMC Controller on page 3**.

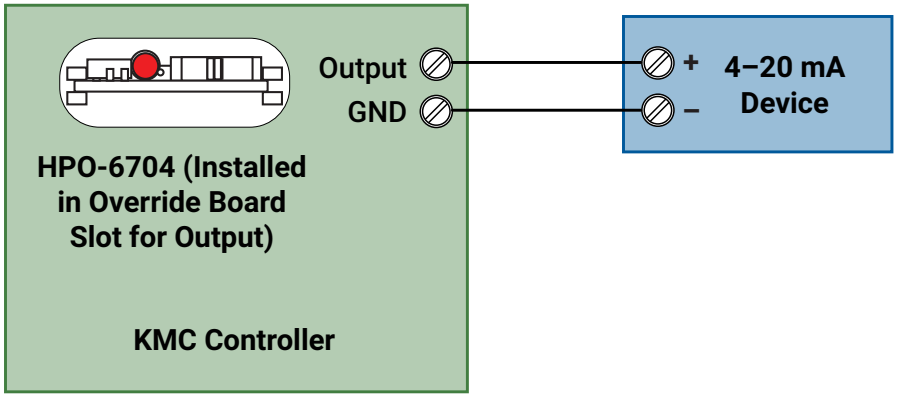

Illustration: HPO-6704 Installed in Compatible KMC Controller

Alternately, an **REE-2005** voltage-to-current converter module can convert a 0–10 VDC output signal from any controller into a 0–20 mA output.

NOTE: The REE-2005 supplies the power to the 4–20 mA output circuit. No external regulated power supply is used in the 4–20 mA circuit. See **Illustration: HPO-6704 Installed in Compatible KMC Controller on page 3**.

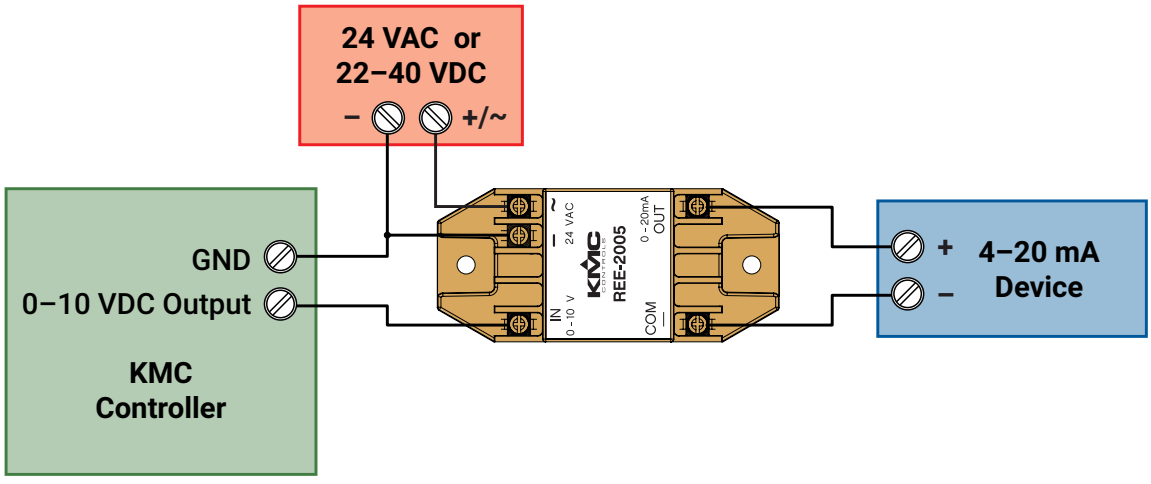

Illustration: REE-2005 Used with Other KMC Controller

For more information about installation and usage of these accessories, see the accessory documentation as well as the installation guide for the respective controller.

Troubleshooting

- Check the wiring.
- Check the controller configuration.
- For an HPO-6704, ensure the board is in the slot corresponding to the output terminals.
- Check the sensor and power supply.

Accessories

HPO-0069	249 ohm resistors, pack of 100
HPO-6704	4–20 mA output override board with adjustable override potentiometer, HAO switch, and LED indicator
REE-2005	Voltage-to-current transducer module, 0–10 VDC to 0–20 mA

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