

Applications Guide



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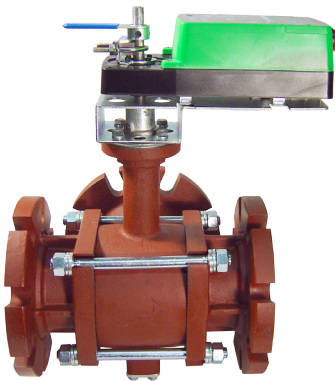
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Important Notices

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Introduction

This application guide gives torque selection, accessory, master/slave wiring, troubleshooting, and other related information.

For help choosing the best model for an application, see [Models on page 4](#) and also the [KMC Actuators Selection Guide](#).

For **specifications and other information**, see the [MEP-7500/7800 Series Data Sheet](#).

For **general mounting, connections, and configuration**, see the [MEP-7200/7500/7800 Series Installation Guide](#).

For possible proportional heating/cooling **applications using the CTE-5202 electronic thermostat**, see the [CTE-5202 Applications Guide](#).

For **valve applications**, see information on:

- [VEB-53 Series](#) Two-Way, Flanged **Ball Valves** (4 to 6")
- [VEB-56 Series](#) Three-Way, Flanged **Ball Valves** (4 to 6")
- [VEF-53 Series](#) Two-Way, Rubber-Lined, **Butterfly Valves** (2 to 6")
- [VEF-56 Series](#) Three-Way, Rubber-Lined, **Butterfly Valves** (2 to 6")

The latest support files are always available on the KMC Controls web site (www.kmccontrols.com).

Torque Requirements for Dampers

Damper manufacturers should provide information about the required minimum actuator torque. If that information is not available, use the following

general guidelines to calculate the required minimum torque.

Damper Type	Up to 1000 FPM	1000 to 2500 FPM	2500 to 3000 FPM
Opposed Blades Without Seals	3 in-lb. per square foot	4.5 in-lb. per square foot	6 in-lb. per square foot
Parallel Blades Without Seals	4 in-lb. per square foot	6 in-lb. per square foot	8 in-lb. per square foot
Opposed Blades With Seals	5 in-lb. per square foot	7.5 in-lb. per square foot	10 in-lb. per square foot
Parallel Blades With Seals	7 in-lb. per square foot	10.5 in-lb. per square foot	14 in-lb. per square foot

Models

Model #	Torque		Control		Built-in Options		
	180 in-lb. (20 N•m) min.	320 in-lb. (36 N•m) min.	Tri-state (Floating)	0–10 VDC, 2–10 VDC, or 4–20 mA Proportional	Feedback: 10K ohm Potentiometer	Feedback: 0/1–5 or 0/2–10 VDC	Fail Safe
MEP-7x01	7500 series (x=5)	7800 series (x=8)	✓				
MEP-7x02				✓		✓	
MEP-7x03			✓		✓		
MEP-7x51			✓				✓
MEP-7x52				✓		✓	✓
MEP-7x53			✓		✓		✓
The MEP-72xx series (120 in-lb.) has been discontinued. Use the MEP-75xx series (180 in-lb.)—or, if less torque is required, an MEP-48xx (80 in-lb., non-fail-safe) or MEP-49xx (90 in-lb., fail-safe) instead. To replace the MEP-70xx series (150 in-lb.), use MEP-75xx series (180 in-lb.). To replace the MEP-77xx series (300 in-lb.), use MEP-78xx series (320 in-lb.).							

***NOTE:** The **MEP-7200** series (120 in-lb.) has been discontinued. Use an MEP-75xx (180 in-lb.)—or, if less torque is required, an MEP-48xx (80 in-lb., non-fail-safe) or MEP-49xx (90 in-lb., fail-safe) instead. Besides maximum torque, the differences between the MEP-7200 and MEP-7500 series include:

Powered Timing (Full Rotation)

MEP-72xx	75–90 seconds, load dependent
MEP-75xx	90–115 sec., load dependent

Fail-Safe Timing (Full Rotation)

MEP-725x	65–100 sec., load dependent
MEP-755x	80–115 sec., load dependent

NOTE: See also the [KMC Actuators Selection Guide](#).

NOTE: Before Jan. 2014, **MEP-7xx2 proportional** models had (besides the 4-20 mA input) a **0–10 VDC input** and **0–5 or 0–10 VDC feedback**. From 2014 through July 2015, they had a **2–10 VDC input** and **1–5 or 2–10 VDC feedback** instead. Starting in August 2015, **all** these options were available and selectable via a jumper and slide switch.

NOTE: When the **0–10 VDC input** is selected (with the jumper), selectable (with a switch) feedback options are **0–5 or 0–10 VDC**. When the **2–10 VDC input** is selected, feedback options are **1–5 or 2–10 VDC**.

Accessories

Auxiliary Switches and End Stops

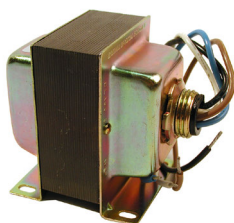


CME-7001/7002 rotary switches (SPDT or dual SPDT) are designed to start and stop auxiliary items (such as electric heat or fans) or to indicate an actuator's fully open or closed position. Switches are independently adjustable for a trip point anywhere within the angular rotation of the driving actuator.



The **HMO-4536** adjustable end stop kit allows rotation to be blocked at a desired angle in one or both directions.

Transformers



An **XEE-6000 series** Class-2 transformer provides 24 VAC power to the actuator:

- | | |
|---------------------|----------------------------------|
| XEE-6111-050 | 120 to 24 VAC, 50 VA, single-hub |
| XEE-6112-050 | 120 to 24 VAC 50 VA, dual-hub |

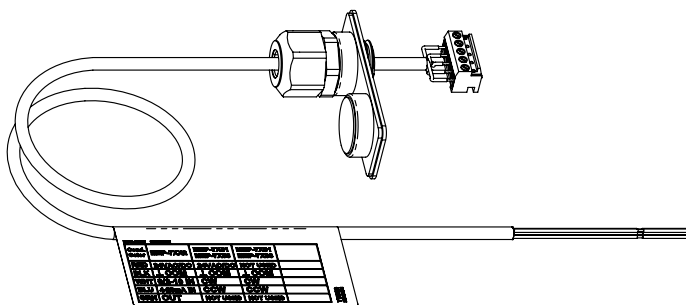
Enclosure, Cord Grip, and Wiring Kits



The **HCO-1152** enclosure kit, consisting of a metal mounting plate, plastic cover, non-rotation bracket, plug caps, and screws, is designed to protect actuators from inclement conditions. See also the HMO-4521 cord grip.



An **HMO-4521** liquid-tight cord grip threads into conduit fittings on MEP-7xxx actuators when an ingress protection rating of IP54 is required. The HMO-4521 accepts 0.18 to 0.40" diameter cables. See also the HCO-1152 and HPO-7001.



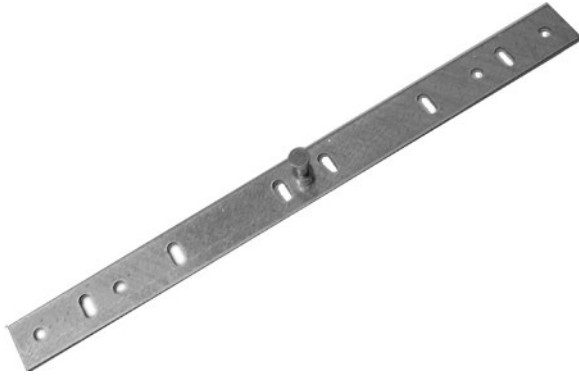
An **HPO-7001** assembled wiring kit has an HMO-4521 liquid-tight cord grip, a 3-foot plenum-rated cable, conduit fitting, and a pre-wired terminal block for the MEP-75xx/78xx actuators:

Thermostat

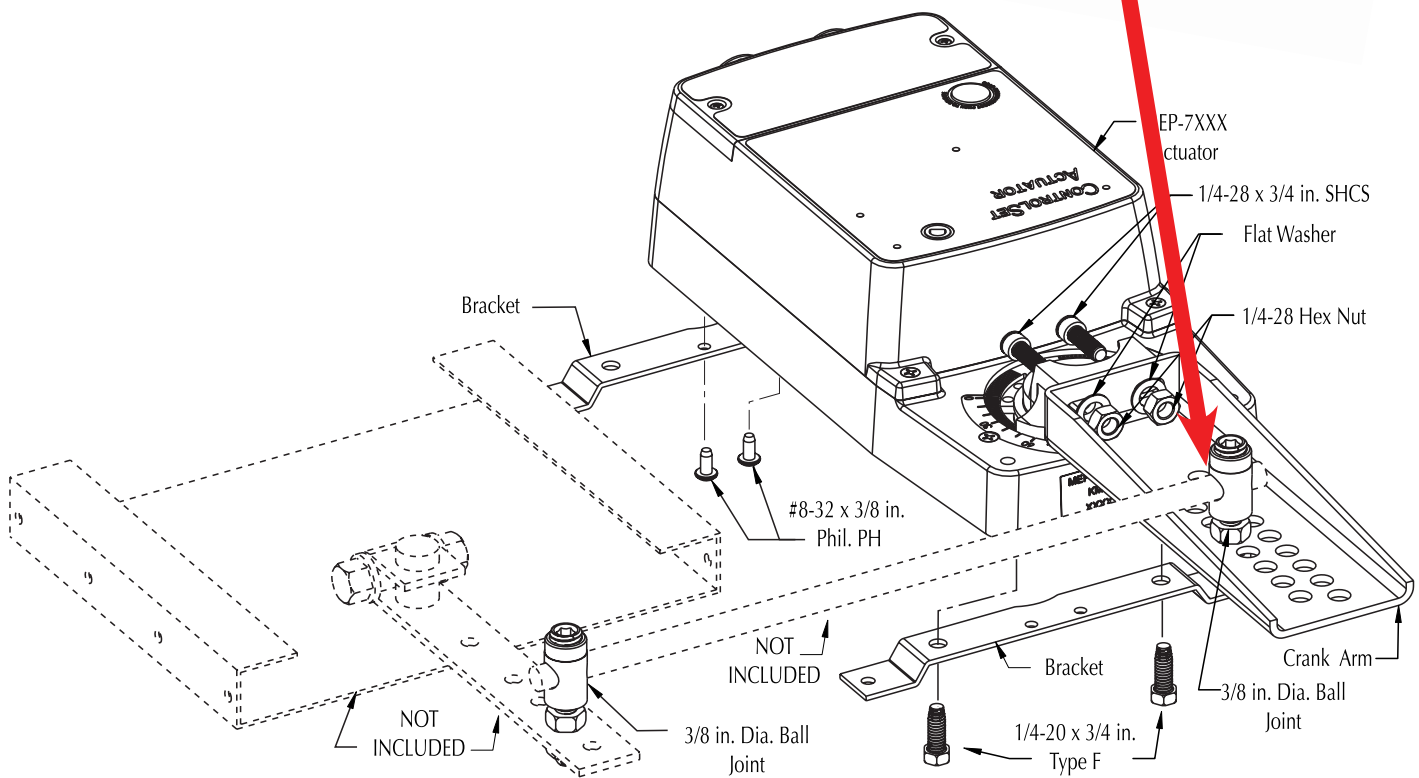


For sample proportional heating/cooling applications using the **CTE-5202** electronic thermostat, see the **CTE-5202 Applications Guide**.

Mounting Brackets and Crank Arm Kit



One **HMO-4535** non-rotation bracket is provided with each actuator. It can span an open distance, or be formed (bent) into a shape that increases the distance between the mounting surface and the actuator.



The **HLO-1020** crank arm kit is used when direct mounting of the actuator is impractical.

Master/Slave Wiring

All Master/Slave Combinations

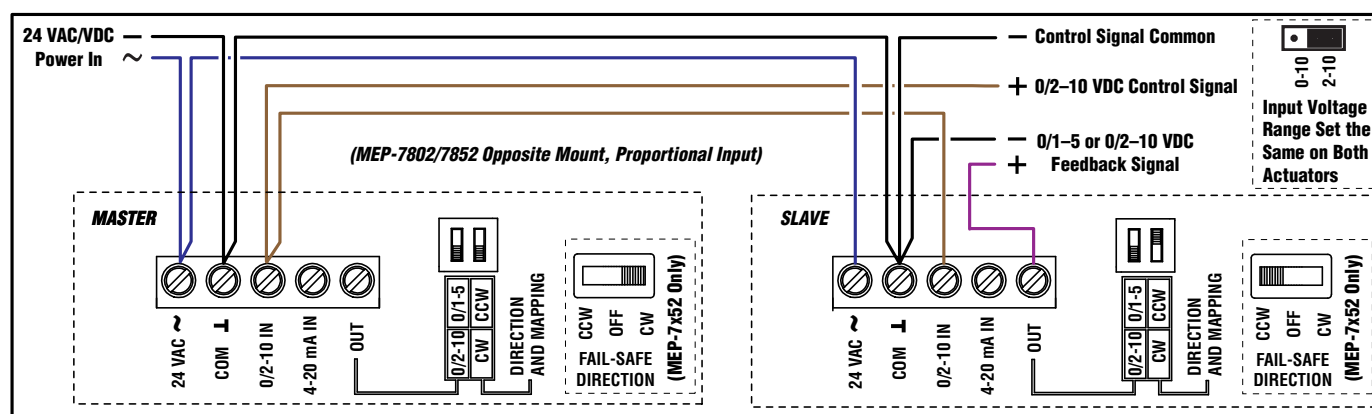
- Follow the instructions in the Wiring (General) section of the [MEP-7200/7500/7800 Series Installation Guide](#) and also include the following steps.
- Connect the actuators according to the relevant illustration below.
- Check that the wiring is properly phased (“~” to “~” and “1” to “1”). In tri-state actuators, CW and CWW are connected to like terminals for “stacked-mounted” applications and opposite terminals for “opposite-mounted” applications.
- On applicable models, set the Master and the Slave’s CW/CCW switches according to the relevant illustration and chart.
- On applicable models, set the Master and the Slave’s FAIL switches according to the relevant illustration and chart.
- If using feedback, connect to one actuator only. Do NOT interconnect the feedback between the master and slave.

NOTE: The 4–20 mA input and auto-mapping options are not available with Master/Slave actuators.

⚠ CAUTION

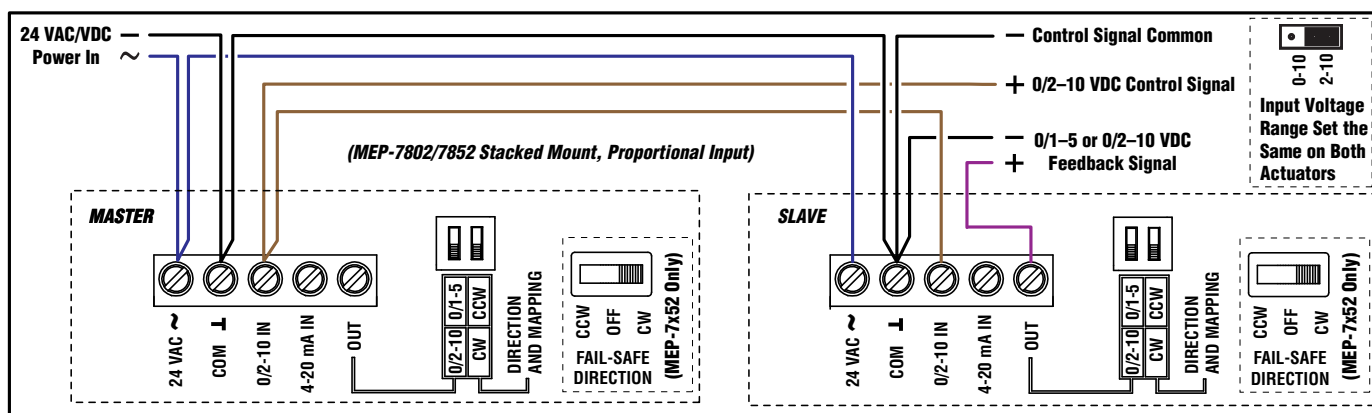
Miswiring or wrong switch positions could result in damage to one or more actuators. Carefully check wiring and switch positions.

MEP-7802/7852 Proportional Actuators



CW/CCW Switches	Fail Switches (MEP-7852 only)	Unavailable Options
Opposite Positions	Opposite Positions	4–20 mA input and Auto-Mapping

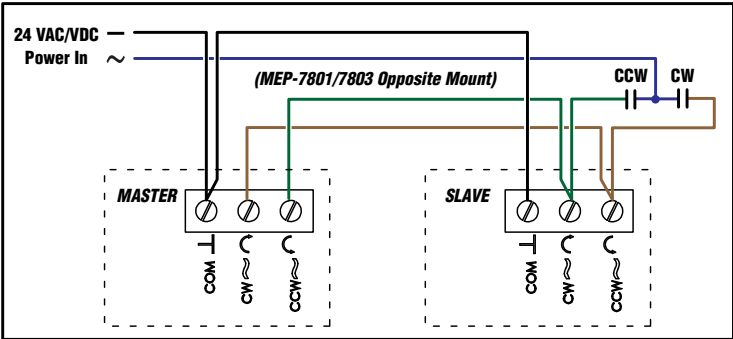
MEP-7802/7852 Dual Actuators, 0–10 or 2–10 VDC, OPPOSITE Mount (e.g., on KMC’s flanged globe valves)



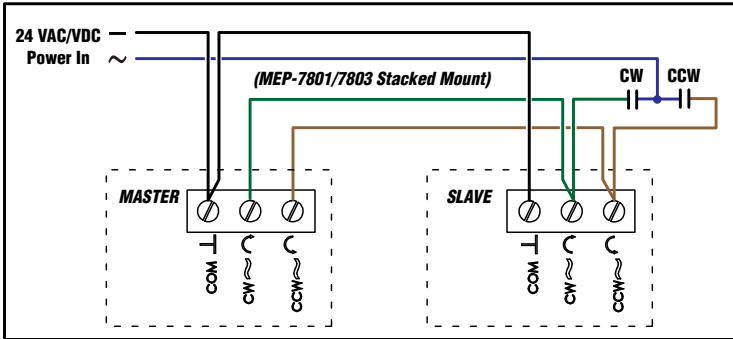
CW/CCW Switches	Fail Switches (MEP-7852 only)	Unavailable Options
Same Positions	Same Positions	4–20 mA input and Auto-Mapping

MEP-7802/7852 Dual, Triple, or Quad Actuators, 0–10 or 2–10 VDC, STACKED Mount (e.g., on KMC’s butterfly valves)

MEP-7801/7803 Tri-State Actuators

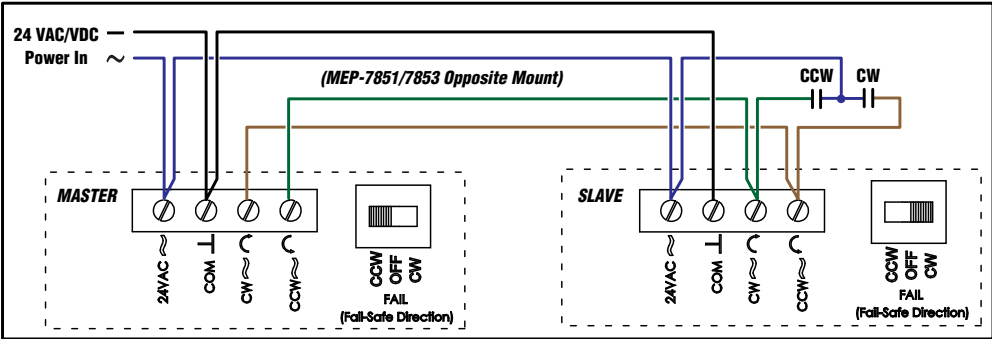


MEP-7801/7803 Dual Actuators, OPPOSITE Mount (e.g., on KMC’s flanged globe valves)



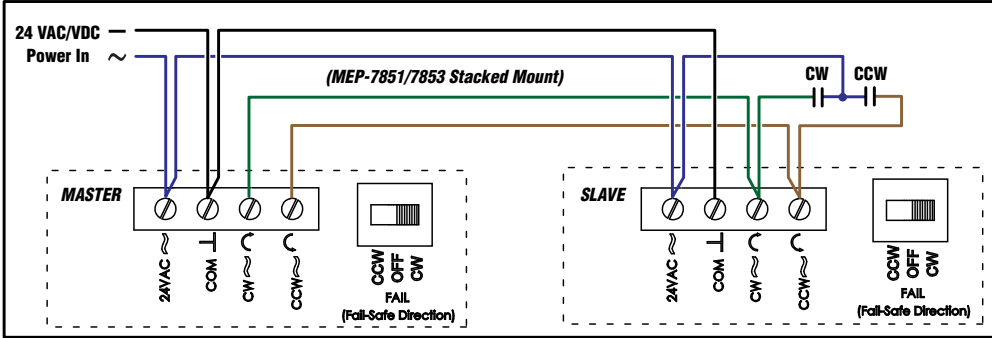
MEP-7801/7803 Dual or Quad Actuators, STACKED Mount (e.g., on KMC’s butterfly valves)

MEP-7851/7853 Tri-State with Fail-Safe Actuators



Rotation Terminals	Fail Switches
CW to CCW and CCW to CW	Opposite Positions

7851/7853 Dual Actuators, OPPOSITE Mount (e.g., on KMC’s flanged globe valves)



Rotation Terminals	Fail Switches
CW to CW and CCW to CCW	Same Positions

7851/7853 Dual or Quad Actuators, STACKED Mount (e.g., on KMC’s butterfly valves)

Configuration

For direction, feedback, and auto-mapping setup, see the [MEP-7200/7500/7800 Series Installation Guide](#).

NOTE: Before Jan. 2014, MEP-7xx2 proportional models had (besides the 4-20 mA input) a **0–10 VDC input** and **0–5 or 0–10 VDC feedback**. From 2014 through July 2015, they had a **2–10 VDC input** and **1–5 or 2–10 VDC feedback** instead. Starting in August 2015, **all** these options were available and selectable via a jumper and slide switch.

NOTE: When the **0–10 VDC input** is selected (with the jumper), selectable (with a switch) feedback options are **0–5 or 0–10 VDC**. When the **2–10 VDC input** is selected, feedback options are **1–5 or 2–10 VDC**.

Troubleshooting

Auxiliary Switch Does Not Work

- Check the auxiliary switch setting. See the [CME-7001/7002 Auxiliary Switches Installation Guide](#).
- Check the wiring. See [Wiring Issues on page 10](#).

Fail-Safe Does Not Work

- After initial connection or reconnection to power, proper fail-safe operation might be delayed up to 20 seconds for the MEP-725x/755x or up to 40 seconds for the MEP-785x (until the capacitors are fully charged).
- Check the Fail-Safe Direction switch. See [Configuration on page 9](#).

Feedback Does Not Work

- Check the feedback switch setting. See [Configuration on page 9](#).
- Check the wiring. See [Wiring Issues on page 10](#).

No Rotation

- Check that the direction switch (Switch 2) is fully engaged in the proper position. See [Configuration on page 9](#).
- Check that the shaft moves freely. (Press and hold the gear disengagement lever and manually rotate the shaft.)
- Check for a tripped circuit breaker to the transformer (or power supply).
- Check polarity and strength of input signal.
- Check for proper supply voltage from the transformer (or power supply) and that it has enough capacity (VA) for all connected devices. See their respective data sheets and [Tips for Connecting 24-Volt Power Application Note \(AN0604D\)](#).
- Check the wiring. See [Wiring Issues on page 10](#).

Rotation in Wrong Direction

- For tri-state models, check the CW/CCW wiring.
- For proportional models, check the position of the direction switch (Switch 2). See [Configuration on page 9](#).
- For fail-safe operation, check the Fail-Safe Direction switch. See [Configuration on page 9](#).

Stroke Range Is Wrong

- Use and/or check position of the HMO-4536 adjustable end stop kit.
- On proportional models, check the auto-mapping. See [Configuration on page 9](#).
- Check the voltage from the controller or thermostat.

Wiring Issues

- For master/slave wiring, see [Master/Slave Wiring on page 7](#).
- Check for correct wiring for the application.
- Check the wiring at the connected devices.
- Use a voltmeter and ohmmeter to check the terminals for expected values.
- See [Tips for Connecting 24-Volt Power Application Note \(AN0604D\)](#).

NOTE: Wiring must be adequate to avoid excessive voltage drop on long runs! Allow plenty of “cushion” in measurements. A meter may be too slow to register transient dips or peaks during startup.

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KMC Controls

19476 Industrial Drive

New Paris, IN 46553

574.831.5250

Fax 574.831.5252

www.kmccontrols.com

info@kmccontrols.com