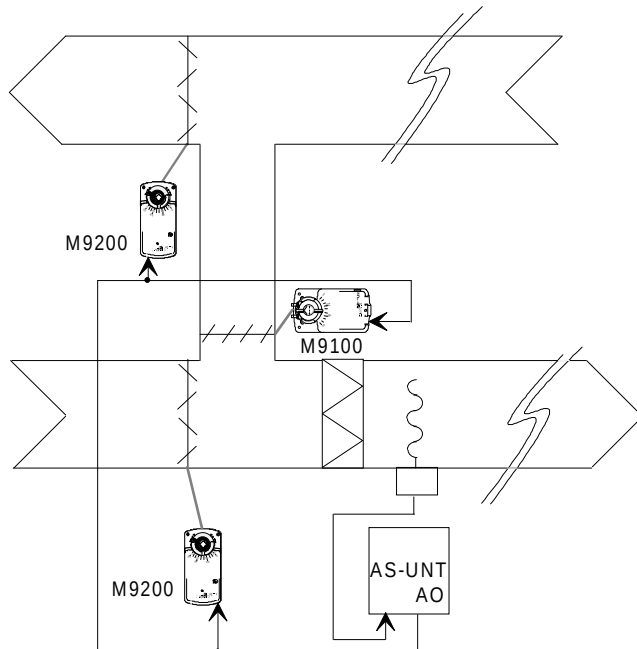


APPLICATION NOTE**M9000 Applications
Proportional Return Air/Exhaust**

This application for the M9000 Series Electric Motor Actuator provides control for exhaust and return air dampers. It can be used with VDC or mA controllers providing the proper positioning for the dampers. The actuator is to be mounted to the preferred driving blade. Obtain the system diagrams for controller installation to verify proper terminals for each actuator.



**Figure 1: Return Air/Exhaust Using
M9200 Series for Outdoor Air**

Return-to-normal actuators are recommended for use with outdoor air dampers.

Because the M9000 Series actuators have speed variations in response to loading, and the M130 actuators do not, the installed speed of the damper and actuator combination must be considered.

If using M130 actuators on a damper with Y20DAB linkage kits, the actual speed of the damper will approach 20 seconds for full travel of 90 degrees. M9108 actuators used for return air/exhaust air dampers would have similar speeds as well as sufficient torque to operate the damper.

If the M130 and Y20DFC combination is used, the full 60 seconds of actuator rotation normally occurs. This would allow the use of M9216 actuators for the return/exhaust air dampers. Both the timing and torque rating of the actuators would be similar.

IMPORTANT: M9000 Series actuators have speed variations in response to loading, therefore, consider the installed speed of the damper and actuator(s) to avoid possible pressure related problems.

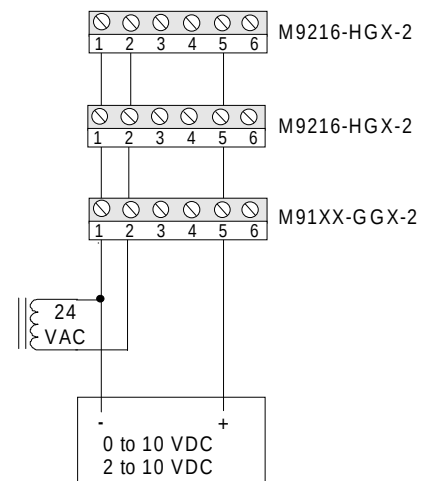
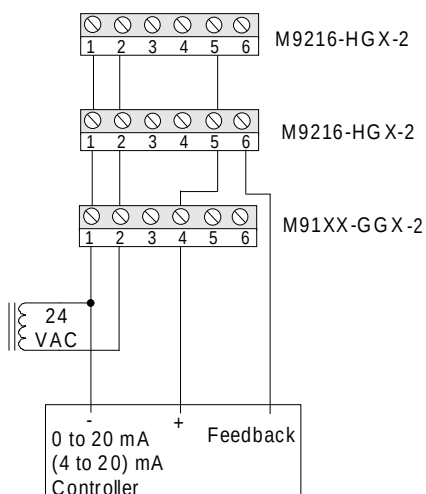


Figure 2: Voltage Controller Wiring



CAUTION: Equipment Damage Hazard.
After a power failure, drive all actuators to a home or known position **before** starting the fan, when operating a system or air handling unit with both spring return and non-spring return actuators on an economizer section. If both the return air and outdoor air dampers are closed when the fan is started, damage to the ducts, dampers, or fan may occur.

Figure 3: Current Controller with Feedback

All actuators must be adjusted for the same operating range to prevent pressure related problems. The feedback signal from the outside air actuator should be used to the controller.

Notes: DX-9100 and A350 controllers can only drive one actuator in the current mode.

TC-6100 controllers should have the analog output voltage limited to approximately 10 VDC by adjusting the band width. Use the 2 to 10 VDC input setting on all Cybertronic™ applications to drive the M9100 fully to its end-stops.

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