MicroMetl

Since 1965

# Hood - Unit Specific
# OA2-SRT
# Install Guide

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**Adjustable 2-Position Ultra Low Leak OA Damper**

*Carrier Small Commercial Rooftop*

## GENERAL

***Read these instructions completely before attempting to install the Accessory Ultra Low Leak Mixing Box.***

**IMPORTANT:** *Read these instructions completely before attempting to install this economizer accessory.*

These instructions are intended as a general guide and do not supersede local codes in any way.

All phases of the installation must comply with all NATIONAL, STATE and LOCAL CODES.

**IMPORTANT:** *This document is the property of the end user and is to remain with the equipment.*

When ordered with controls the MicroMetl Economizer/Mixing Box utilizes the latest technology available for integrating the use of free cooling with mechanical cooling for packaged rooftop units and air handlers. The solid-state control system optimizes energy consumption, zone comfort, and equipment cycling by operating the compressors when the outdoor-air temperature is too warm, integrating the compressor with outdoor air when free cooling is available, locking out the compressor when outdoor-air temperature is too cold and Demand Control Ventilation (DCV) is supported.

Depending on the controls options, this system can be used with single or multiple speed indoor fans.

***Unpack and inspect economizer contents from carton. Contact MicroMetl immediately if any parts are missing or damaged.***

MicroMetl Economizer's Outdoor Air Dampers utilize gear-driven technology with a Direct-Mount Spring Return Actuator that will close upon loss of power and can be used in either a Vertical or Horizontal Airflow Configuration. The damper assembly travel can be adjusted to allow from ~ 25% to ~ 100% outdoor air for the applicable rooftop unit.

| PART NUMBER | QTY | DESCRIPTIONS |
|---|---|---|
| OA2-SRT12CB-D00S<br>OA2-SRT34CB-D00S | 2 | Hood Side |
| | 1 | Hood Top |
| | 1 | Hood Divider |
| | 1 | Aluminum Filter |
| | 1 | Bottom Panel |
| | 1 | Damper Assembly |
| | 1 | Hardware Bag |
| OA2-SRT05CB-D00S | 2 | Hood Side |
| | 1 | Hood Top with Rainshield Angles |
| | 1 | Hood Divider |
| | 2 | Aluminum Filters with Divider |
| | 1 | Bottom Panel |
| | 1 | Damper Assembly |
| | 1 | Hardware Bag |

**Inspect Shipment for Damage:**
File claim with shipping company if accessory is damaged or incomplete. Contact your supplier for any missing parts.

**Important:** *To eliminate any delays in shipping and to ensure part(s) replacement accuracy, provide the Economizer Model Number and Production Number.*

**Check Unit Clearance:**
In addition to the clearances required for the RTU, provide sufficient space for airflow clearance, wiring, and servicing this accessory after it is mounted on unit - See Submittal Data for unit dimensions and weight.

Exhaust/Outside Air Hood 30" Sides 24"

## SAFETY CONSIDERATIONS

**⚠ WARNING**

Turn off main power to the roof top unit (RTU) or air handling unit (AHU). Lockout and tag disconnect switch before starting installation, performing service, or maintenance operations.

Electrical shock and/or moving parts could cause personal injury, or death.

**CAUTION**

**HEAVY OBJECT**

To prevent personal injury use lifting aides and proper lifting techniques when installing, removing or replacing.

**CAUTION**

When working on air conditioning equipment, observe precautions in literature, tags and labels attached to the unit and other safety precautions that may apply.

Installation and servicing of air conditioning equipment can be hazardous due to high pressures of hazardous gases, moving parts, electrical components, and sharp sheet metal parts. Wear safety glasses and gloves.

Only trained and qualified service personnel should install, service, or repair air conditioning equipment. Untrained personnel can perform basic maintenance functions of cleaning coils, and cleaning and replacing filters, but all other operations should be performed by trained service personnel.

## INSTALLATION

To install the outdoor damper, perform the following:

1. Remove Filter Access (Upper) Panel **(Fig. 1)** by raising panel and swinging panel outward. Panel is now disengaged from track and can be removed. No tools are required to remove Filter Access Panel. Set this panel aside for later re-installation.

2. Remove the Lower Return Air Cavity Access Panel **(Fig. 1)** and discard.

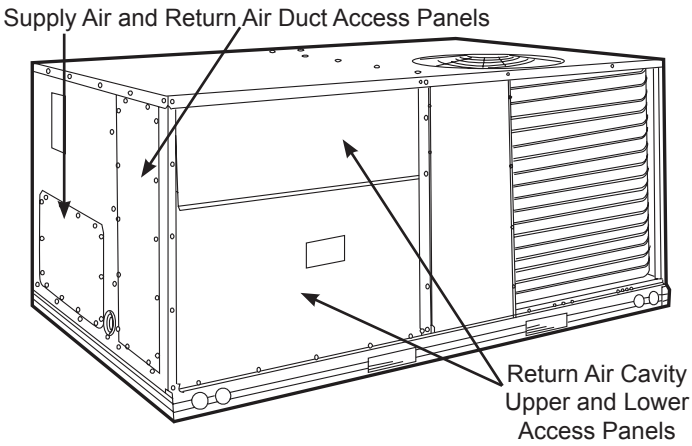



***Fig. 1 - RTU Panel Identification***

3. Install galvanized, Insulated Bottom Panel per **Fig. 3**, with the slot at the top of the panel. The lip of the slot should fit behind the Corner Post as shown. Screw in place.

4. Assemble Outdoor Air Hood Top, Sides and Divider (Rainshield and Filter Divider for 05 model) onto unit as shown in **Fig. 2.**

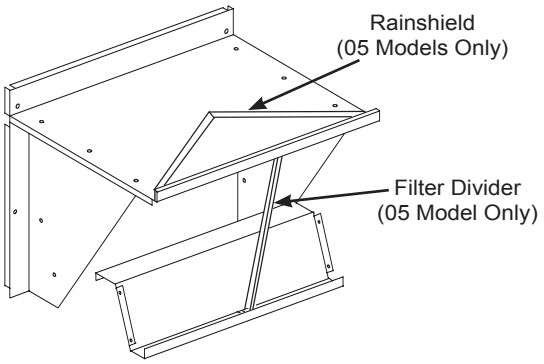



***Fig. 2 - OA Hood Assembly***

5. Lift Damper Assembly and set in place over the top of the Bottom Panel, per **Fig. 3.** Secure the Damper Assembly in place with provided screws.

6. Remove the Jumper Plug shipped attached to the Economizer Harness in the HVAC unit. **DO NOT DISCARD**. Connect the plug from the Damper Actuator Assembly to the Economizer Plug **(Fig. 6)** in the HVAC unit. Set the Jumper Plug aside in case it is determined at a later date that the 2-Position Damper is no longer required, at which time the Jumper Plug can be re-installed.

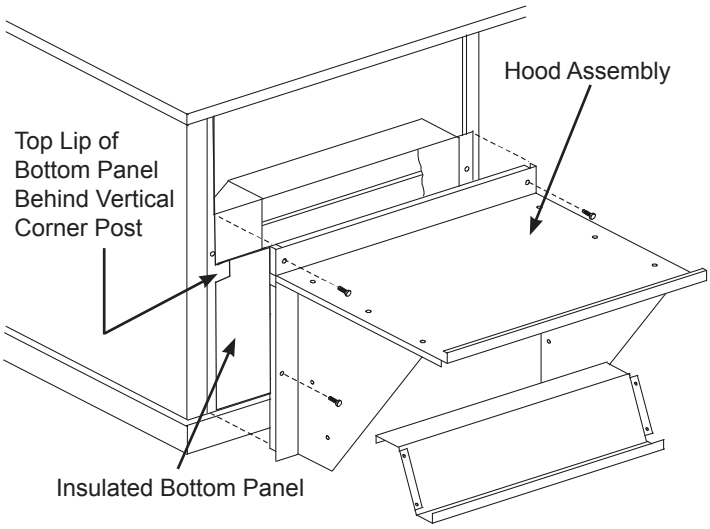



***Fig. 3 - Installing OA Hood and Damper***
***OA2-SRT12/34 Shown***

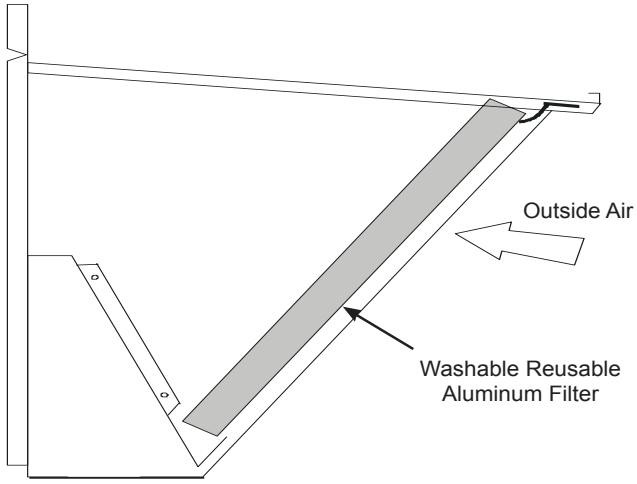



***Fig. 4 - Side View of Hood Showing Filter Location***

7. Install the Assembled OA Hood onto the HVAC unit, covering the Damper Assembly. Screw in place.

8. Install the provided Aluminum Filter into the Hood. Lock in place with top filter clips. **(See Fig. 4.)**

9. Replace the Top Filter Access Panel.

10. Determine quantity of ventilation air required for building. Record amount of air for use in Step 11.

To determine the minimum position setting, calculate the appropriate mixed air temperature using the following formula.

**Note:** *At least 10°F temperature difference should be present between the Outdoor and Return Air Temperatures when performing this task.*

(TO x OA) + (TR x RA) = TM

Where:
TO = Outdoor Air Temperature

OA = Desired percent of Outdoor Air

TR = Return Air Temperature

RA = Desired percent of Return Air

TM = Mixed Air Temperature

As an example, if Local Codes require 10% outdoor air during occupied conditions, the outdoor air temperature is 60°F, and the return air temperature is 75°F; what would the mixed air temperature be?

(60 x .10) + (75 x .90) = 73.5 F

Depending on the amount of time needed to make the adjustments, it may be necessary to recalculate the mixed air temperature as the indoor and outdoor temperatures change.

**Note:** *Damper movement from full open to full close (or vice versa) is approx. 30 seconds.*

11. To limit the maximum open position of the damper to the amount of desired Ventilation Air from Step 10, the Rotation Limiter may need to be relocated. The adjustment is made by removing the C-Clip holding the Limiter, which is on the backside of the Actuator, and repositioning the bracket. This may require the removal of the Actuator. Re-install the Limiter at the desired position, then re-install the C-Clip **(See Fig. 5).** This adjustment can be made through the RTU Horizontal Return Panel to access the Actuator.

12. Remove Lockout Tag and restore base unit to operation.

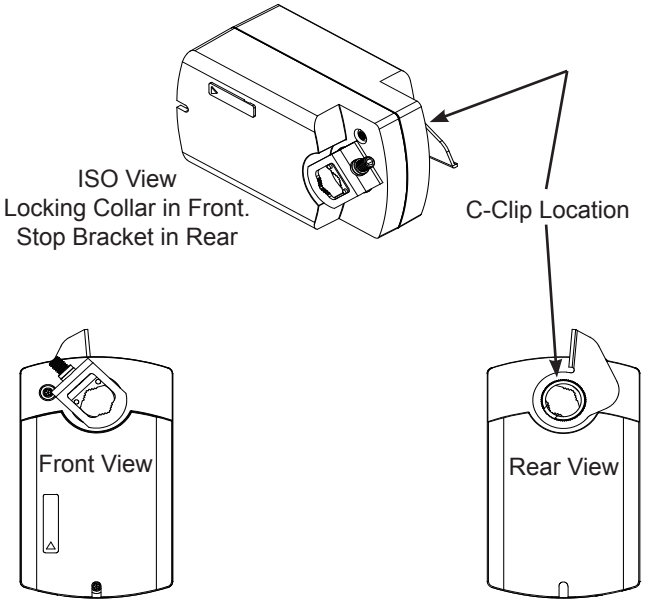



***Fig. 5 - Multiple Views of Actuator***

## SEQUENCE OF OPERATION

### Cooling

When the Room Thermostat calls for 1st Stage Cooling, the Compressor Contactor # 1 is energized along with the Outdoor-Fan Motor(s). The Indoor-Fan Motor is energized and the 2-Position Damper moves to its field-adjusted position. On a call for 2nd Stage Cooling, Compressor Contactor # 2 is energized (2 stage compressors on some units). When the Indoor-Fan Motor is de-energized, the 2-Position Damper moves to the fully closed position.

### Heating

When the Room Thermostat calls for Heating, the heating controls are energized as described in the base unit Installation, Start-Up and Service Instructions. The Indoor-Fan Motor is energized and the 2-Position Damper moves to the set position. When the Indoor-Fan Motor is de-energized, the 2-Position Damper moves to the fully closed position.

### Ventilation (Continuous Fan)

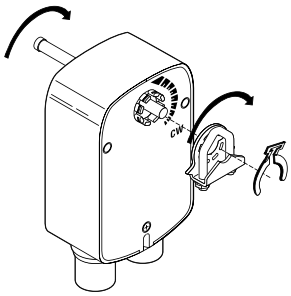
The 2-Position Damper remains at set position as long as the Indoor Fan is energized. When the Indoor Fan is cycled off, the 2-Position Damper moves to the fully closed position.

### Low Temperature Lockout (Optional)

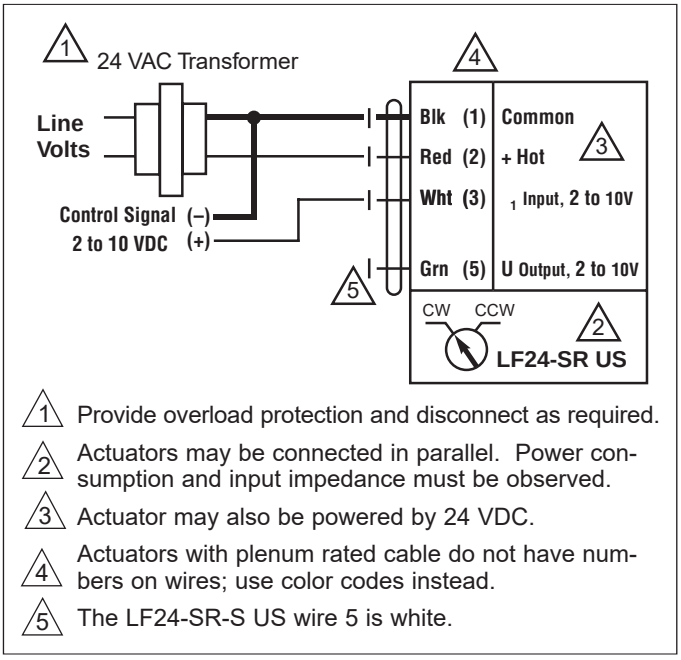
If desired, a Temperature Lockout Switch can be field installed to override the damper signal and keep it closed if the OA Temperature falls below a specified air temperature. The recommended method is to use an Outside Air Lockout Switch or Thermostat to make/break the red wire on the Damper Actuator Harness.

# LF24-SR (-S) US

**Proportional damper actuator, spring return safety, 24 V for 2 to 10 VDC, or 4 to 20 mA control signal. Output signal of 2 to 10 VDC for position indication.**

## Wiring diagrams




1. Provide overload protection and disconnect as required.
2. Actuators may be connected in parallel. Power consumption and input impedance must be observed.
3. Actuator may also be powered by 24 VDC.
4. Actuators with plenum rated cable do not have numbers on wires; use color codes instead.
5. The LF24-SR-S US wire 5 is white.

Direction of rotation

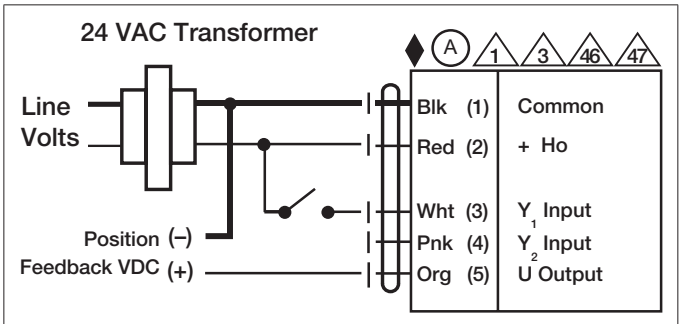
CW CCW

**LF24-SR US**

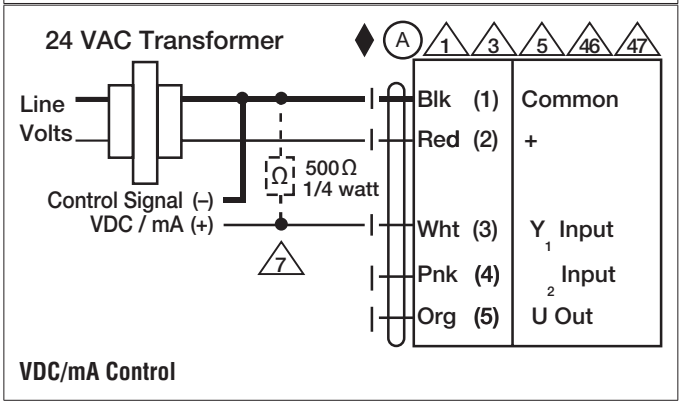
spring return reversible with cw/ccw mounting control direction selected by switch:
CW=CW with a decrease in signal
CCW=CCW with a decrease in signal

# AFB24-MFT

**Modulating, Spring Return, 24 V, Multi-Function Technology®**


**On/Off**




**VDC/mA Control**

# MicroMetl

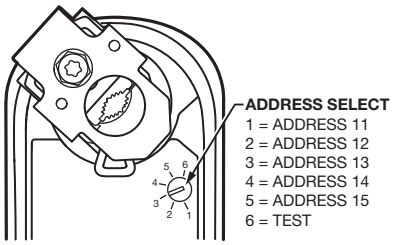
# *CB-D00H/-H

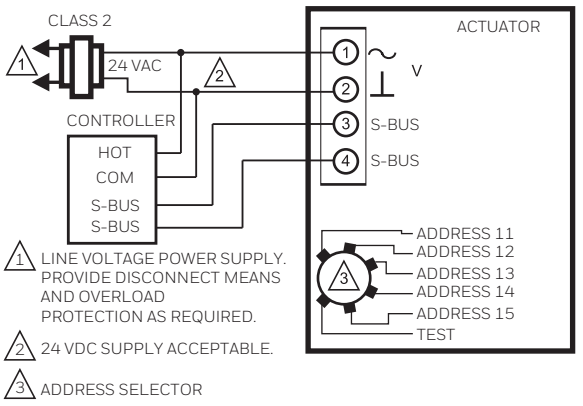
## DIAMOND SYLK 27IN/LB**

MS7103, MS7503, MS3103

** Make sure the Economizer actuator settings are correct. They should be on ADDRESS 1 Set Switch to 1. **(Actuator might come in on #6 so change back to #1)**


There are 5 effective Sylk addresses that you can choose from. For example, to select Sylk address 11 move the range pot to 1.



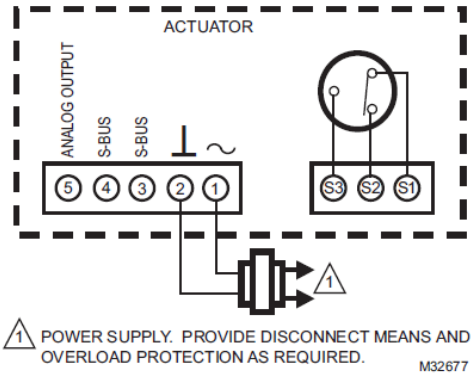




**Wiring for SYLK BUS control, MS3103.**

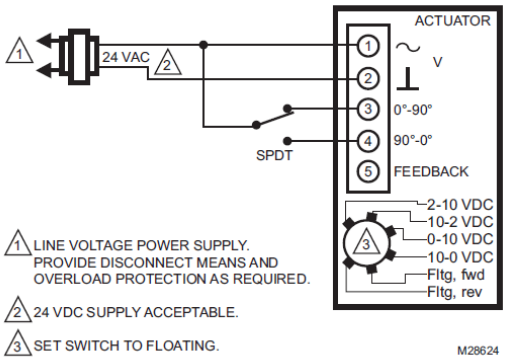
## 3 Nm, 5 Nm Series Spring Return Direct Coupled Actuators**

MS3103, MS3105, MS4103, MS4105, MS7403, MS7405, MS7503, MS7505, MS8103, MS8105


**Terminal block details (MS31)**

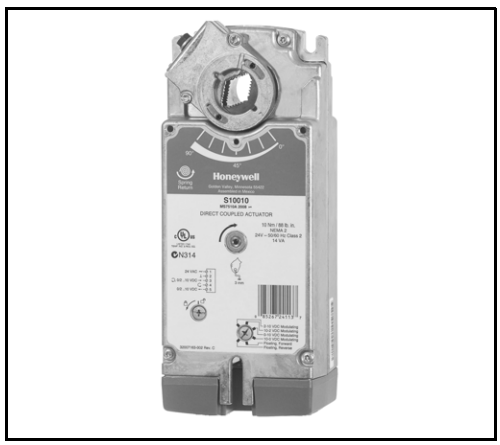


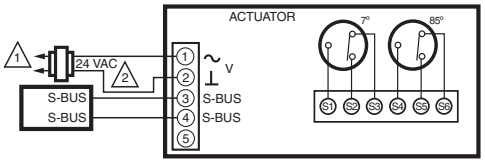

**MS75/MS74 series**




## MSXX10, MSXX20 Series***

88 AND 175 LB-IN (10 AND 20 NM) SPRING RETURN DIRECT COUPLED ACTUATORS

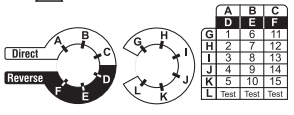



NOTES: AFTER TRANSFORMER SELV–SAFETY EXTRA LOW VOLTAGE FOR INTERNAL CIRCUIT AND MOTOR.

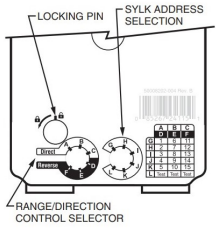
1 LINE VOLTAGE POWER SUPPLY. PROVIDE DISCONNECT MEANS AND OVERLOAD PROTECTION AS REQUIRED.

2 24 VDC SUPPLY ACCEPTABLE.




M35129

**Wiring for Sylk BUS, MS31 series.**




*** Make sure the Economizer actuator settings are correct. They should be on "Direct" for the RANGE/DIRECTION CONTROL "C" and "G" for the SYLK ADDRESS selection.
**(This is for -D00H-H)**

## FEATURES

- 2-10Vdc with signal inversion
- Economizer applications
- 4-20mA applications


**987-105**
**GMA 151.1PRHEEM**
**GCA161.1P**

| Description | Label | Description | Function |
|---|---|---|---|
| **Inverse Acting** | | **Direct-Acting** | **Input Signal Inversion** |
| **Inverse-Acting Feedback** | | **Direct-Acting Feedback** | **Feedback Signal Inversion** |
| | | | **Not In Use** |

| Description | Label | | Description | Function |
|---|---|---|---|---|
| Counterclockwise | | | Clockwise | Rotary angle direction |
| Active | | 0 | Off | Self-adaptation to mechanical range |
| 2-10 Vdc | 2-10 | 0-10 | 0…10 Vdc | Positioning control signal 2-10 or 0-10 |
| Offset 0-5V<br>Span 2-30V | ADJ | 0-10 | 0...10 Vdc | Positioning signal.<br>Turn on or off capability to adjust offset/span. |

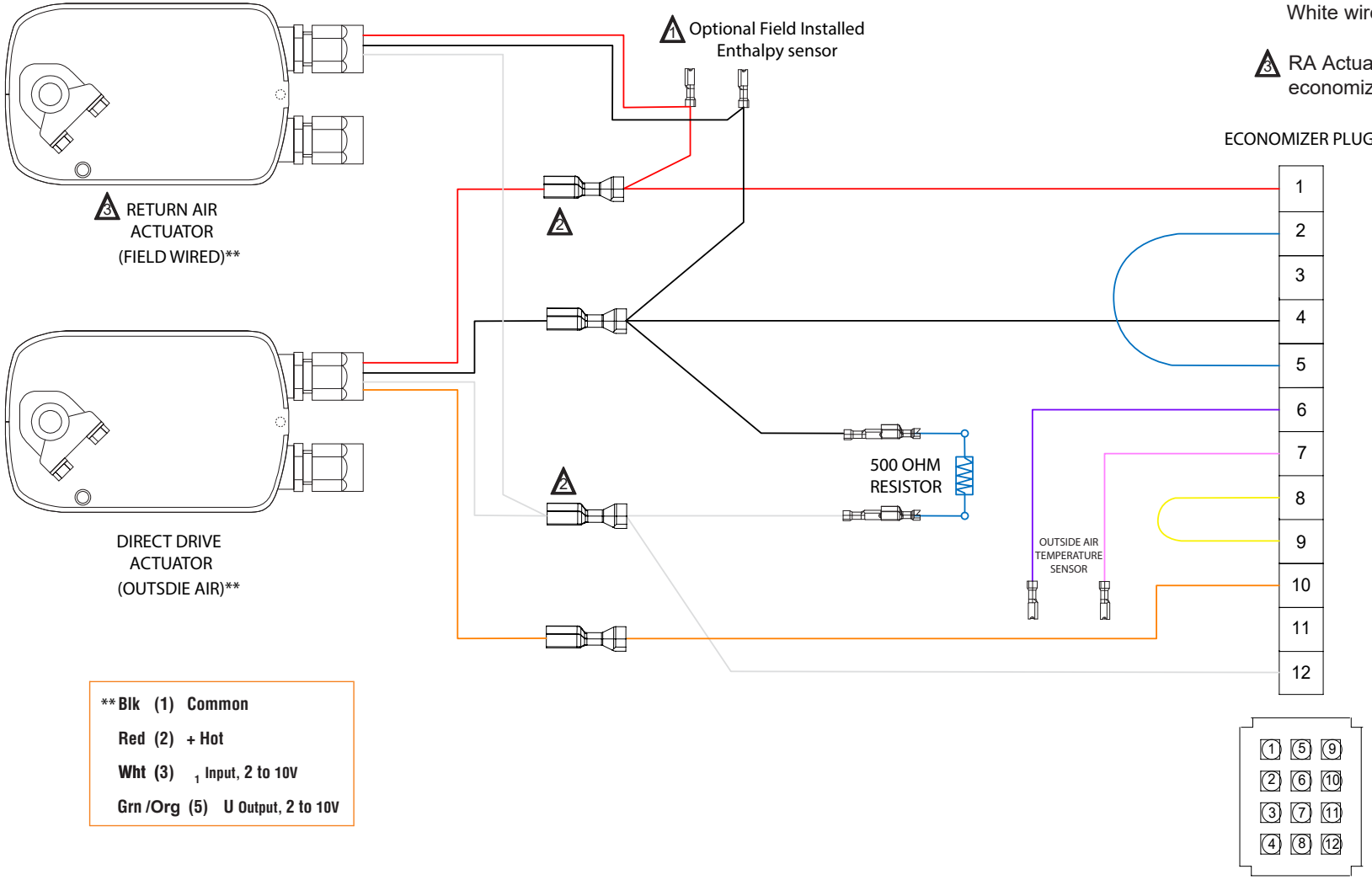
# MicroMetl EC*-SRT/MRT**C*-D0DB-X/4

Since 1965

⚠1 Optional Field Installed Enthalpy sensor.
Connect Red wire to 24V and Black wire to GRND on sensor.

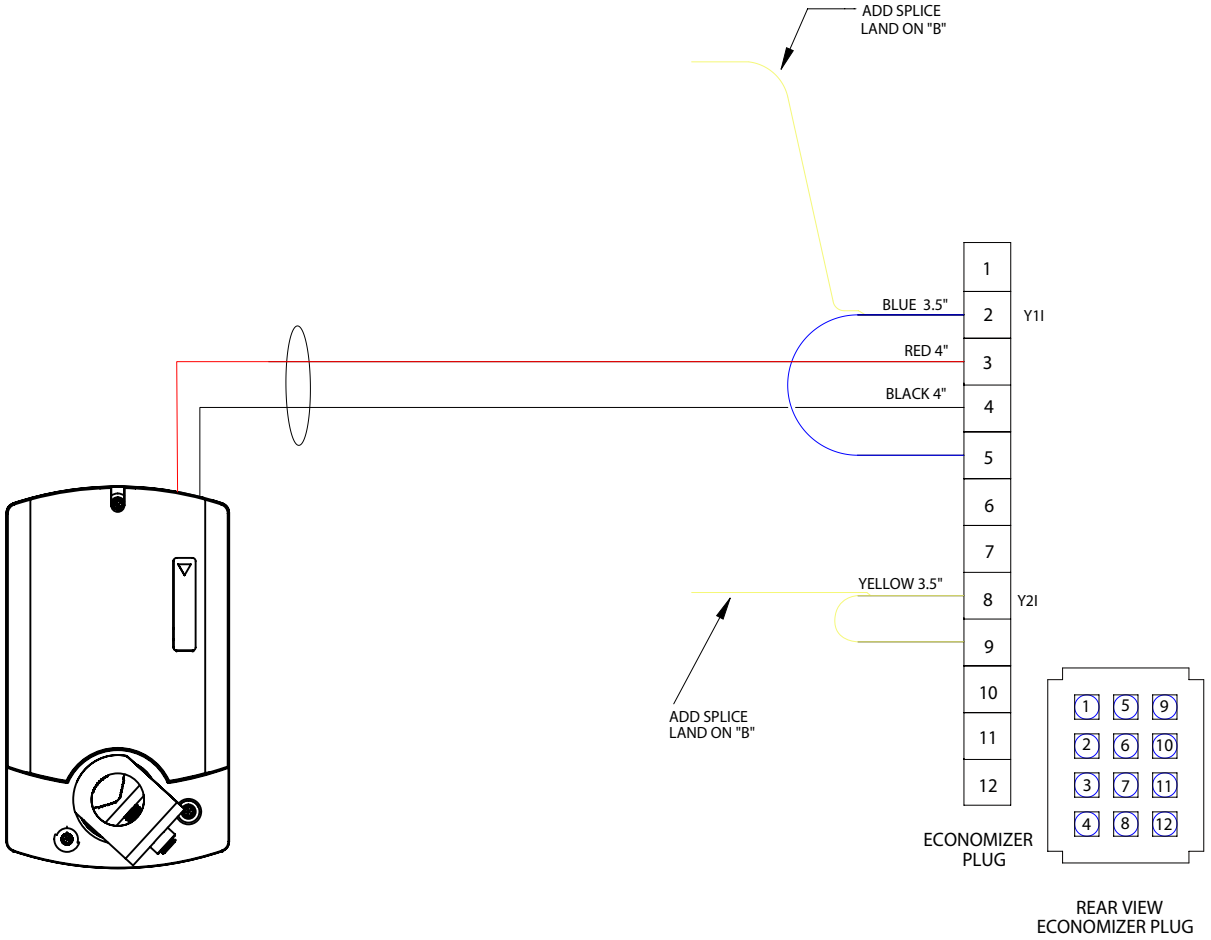
⚠2 Optional Field Installed CO2 Sensor 4-10mA Output
Connect **–** to Red wire and **+** to White wire.

⚠3 RA Actuator wiring only for ECE economizers.



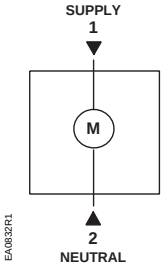

** Blk (1) Common
Red (2) + Hot
Wht (3) ₁ Input, 2 to 10V
Grn /Org (5) U Output, 2 to 10V

**NOTE:** *Outside air damper will open when return is closed and vice versa.*




## GQD121.1P

## Spring Return
## 2-Position
## 24 Vac/dc




1. Chec Operation:
   a. Connect wires 1 (red) and 2 (black) to 24 Vac/dc power supply.
   Allow the actuator shaft coupling to rotate from 0° to 90°.
   b. Disconnect wire 1 (red) and the actuator shaft coupling returns to the "0" position.
2. Chec Spring Return:
   a. Connect wire 1 (red).
   Allow the actuator shaft coupling to rotate halfway.
   b. Disconnect wire 1 (red).
   The spring returns the actuator shaft coupling to the fail- safe "0" position.