

# MINI-TOP ELECTRONIC ACTUATOR (rotary type; for damper)

MODEL **DM05R**

## BEFORE USE ....

Thank you for choosing us. Before use, please check contents of the package you received as outlined below.

If you have any problems or questions with the product, please contact our sales office or representatives.

### ■ PACKAGE INCLUDES:

- Mini-Top Electronic Actuator .....(1)
- Cable ..... 1 meter (1)
- Option (not included in the product)  
Bracket .....(1)

### ■ MODEL NO.

Confirm Model No. marking on the product to be exactly what you ordered.

### ■ SAFETY PRECAUTIONS

Before use, please read all the following precautions carefully to ensure the safety. These safety precautions, classified into "WARNING" and "CAUTION" according to the degree of damage that may be caused by improper use of the product, are imperative to prevent an accident. After reading, be sure to keep this manual always in a visible and accessible place for the user.

△ WARNING Suggesting that failure to observe the precautions could result in death or serious personal injury.

△ CAUTION Suggesting that failure to observe the precautions could result in personal injury or damage to the property.

#### △ WARNING

Remove power supply to the actuator before wiring to the device. It could cause electric shock.

Do not disassemble or modify the device in any way. It could cause electric shock, burn, or injury.

DO NOT step onto the actuator.  
DO NOT rest a heavy object on or against the device.  
It could cause personal injury.

When installing the actuator outdoor or where it is exposed to rain or water drops, adequate precautions must be taken for preventing water from entering inside through wiring conduits. It could cause electric shock.

#### △ CAUTION

DO NOT remove the cover of the actuator. It may cause electric shock or injury.

### ■ INSTRUCTION MANUAL

This manual describes necessary points of caution when you use this product, including installation, connection and basic maintenance procedures.

This device is factory-adjusted and calibrated according to the Ordering Information Sheet.

## POINTS OF CAUTION

### ■ POWER INPUT RATING & OPERATIONAL RANGE

- Locate the power input rating marked on the product and confirm its operational range as indicated below:

DC Power: 24V DC rating  $\pm 10\%$ , 0.18A

Universal: 24V DC rating  $\pm 10\%$ , 0.18A

24V AC rating, 21.6 - 28.8 V AC,

47 - 66 Hz, 0.35A

### ■ GENERAL PRECAUTIONS

- Remove the power supply to the actuator before wiring the device.
- DO NOT install signal wires and power supply wires together in one duct because it may cause a malfunction due to induction noises. Alternatively, use shielded cables for the input signal wires to prevent interference from such noises.

### ■ INSTALLATION

- Indoor, or outdoor where the device is NOT exposed to direct sunlight.
- Operating temperature -10 to +55°C (14 to 131°F)
- Operating humidity 30 to 90% RH (non-condensing)
- The device is not designed to withstand all vibrations. We do not guarantee long-term use of the device even with small vibrations. Please use the device only after evaluating in an actual installation environment.
- Install the device where it can be reached for maintenance and inspection. Be sure to allow at least 20 cm (7.9 inches) clearance above the device and around the terminal box.
- Keep away from hazardous atmosphere such as explosive or corrosive gases.

### ■ PID CONTROL SIGNAL

- Choose PID parameters carefully so that the MV remains as stable as possible to prevent hunting. Unstable control shortens the life of actuator.

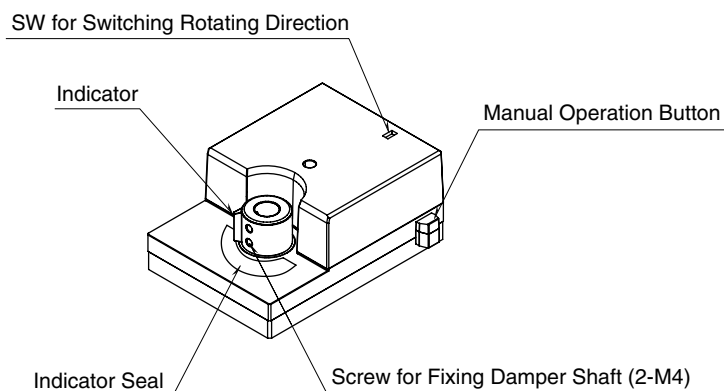
### ■ SOUND ACCOMPANYING MOTOR ROTATION

- The sound of the gear rotating inside the machinery is generated.

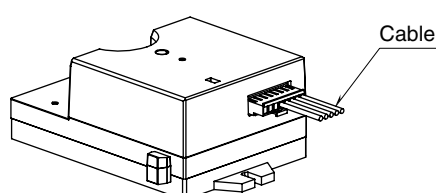
### ■ HEAT TRANSFER

- Due to the effect of radiant heat from damper and heat transfer from the shaft, there is a risk that the device may become high-temperature and result in malfunction. Install the device in a way that minimizes the impact of heat as much as possible.

## COMPONENT IDENTIFICATION

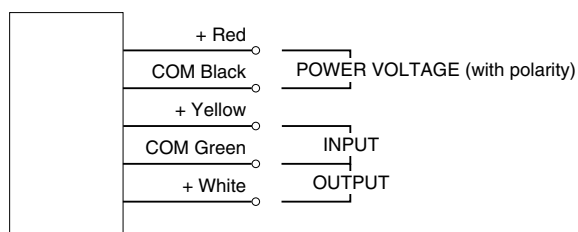


### • Cable position



## WIRING CONNECTION

The power voltage has polarity.



The COM port of the power is connected to the COM port of the input/output.  
Ensure proper alignment when connecting AC power.

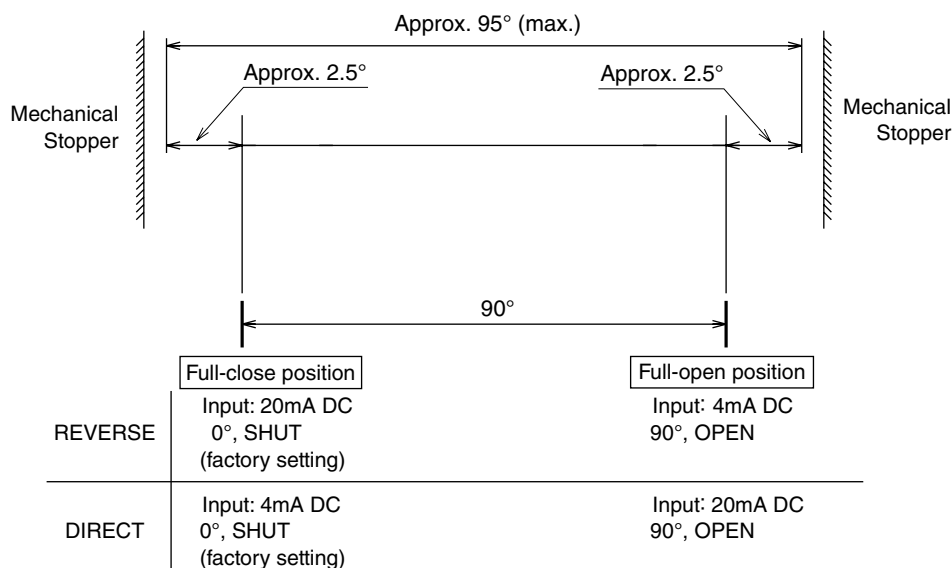
# OPERATION

## ■ REVERSE and DIRECT (FOR DAMPER)

| SW  | Operation | Input Signal      | Output Stem Rotation | Opening Display | State           |
|-----|-----------|-------------------|----------------------|-----------------|-----------------|
| CCW | REVERSE   | 4 mA DC / 1 V DC  | CW.                  | O (Open)        | Default setting |
|     |           | 20 mA DC / 5 V DC | CCW.                 | S (Shut)        |                 |
| CW  | DIRECT    | 4 mA DC / 1 V DC  | CCW.                 | S (Shut)        | By the switch   |
|     |           | 20 mA DC / 5 V DC | CW                   | O (Open)        |                 |

The standard specification is set to reverse operation.

## ■ OUTPUT SPAN ADJUSTMENT



## ■ HOW TO USE MANUAL OPERATION BUTTON

- Press the manual operation button when the power voltage is OFF.
- When the manual operation button is pressed, the output stem rotates by hand force.  
To rotate the output stem, keep pressing the manual operation button.  
When you release your hand from the manual operation button, the button returns to its original position.

### Step

- Press the manual operation button with a finger. (De-energized state)
- Rotate the output stem by hand force. (De-energized state)
- At the desired position to stop the output stem, release your finger from the manual operation button. (De-energized state)
- After releasing your finger from the manual operation button, lightly rotate the output stem left and right to confirm that it does not operate.  
If it moves left and right, press the manual operation button multiple times.
- The gear is transmitted, and electrical control becomes possible.

## MAINTENANCE

For effective use and longer life of the Mini-Top electronic actuator, regular checking appropriate for its operating conditions are recommended. Refer to the following table.

| ITEM                             | CHECKING POINT  | HOW TO PROCEED  |
|----------------------------------|---|---|
| Stem operation                   | Apply input 0%, 50%, 100%, then back to 50%, 0%.<br>Check that the actuator operates to the correct positions at respective input values. | Repair or calibrate the device.   |
| Abnormal sound                   | No abnormal sound is heard during operation.  | Repair or calibrate the device.   |
| Water or rust inside the housing | Check that there is no water or rust inside the device.   | Remove water and dry the housing and the parts inside.<br>Replace rusted parts, if any. |
| Screws                           | Check that screws and bolts are securely fastened.  | Re-tighten them, if loose.  |

For repair or parts replacement, contact us or our representatives.

### ■ LUBRICATION

There is no need of oiling the Mini-Top electronic actuator in normal operating conditions.

### ■ REGULAR TEST RUNNING

If the damper is not frequently operated, run a test operation regularly (once a week, for example) to ensure that the actuator operates normally.

## TROUBLESHOOTING

| TROUBLE                | POSSIBLE CAUSE                     | HOW TO PROCEED  |
|------------------------|------------------------------------|---|
| Actuator does not work | Power is OFF                       | Check the power voltage.                                |
|                        | The polarity is different          | Check the power circuit.                                |
|                        | Input error                        | Check the input signal level.                           |
|                        | Motor deadlock                     | Turn off the power and turn on again.                   |
|                        |                                    | Switch the input signal between maximum and minimum.    |
|                        | The screw of output stem is loose. | Tighten the screw with an L-wrench. (size: M4, 2 parts) |
| Unstable operation     | Abnormal power voltage,<br>Noise   | Check power voltage and noise in input signal.          |

## LIGHTNING SURGE PROTECTION

We offer a series of lightning surge protectors for protection against induced lightning surges. Please consult us to choose appropriate models.