

Direct Coupled Damper Actuator (Spring-return Type)

General

Model MY6055B2001 direct coupled damper actuator is a motorized actuator to open/close air damper for ventilation and air-conditioning systems.

Model MY6055B2001 has the spring-return function that automatically rotates the damper shaft to the damper closing position and shuts off the damper in the event of power shutdown. This is suitable for controlling air dampers in the systems requiring high safety.



Features

- Spring-return mechanism rotates the damper shaft to the damper closing direction and then stops the shaft at the shutoff position.
- Torque limit function protects the motor from overload.
- Manual override function enables to adjust the actuator without being powered.
- Rotating direction is reversible by turning the actuator the other way around.
- Brushless DC motor stabilize the operating time regardless of the size of the load.
- The actuator contains two auxiliary contacts (SPDT).

SPDT: Single pole, double throw

Model Numbers

Model number	Specification
MY6055B2001	Direct coupled damper actuator (two-position control, spring-return type, with auxiliary switches)



Safety Instructions

Please read instructions carefully and use the product as specified in this manual. Be sure to keep this manual near by for ready reference.




Usage Restrictions




This product is targeted for general air conditioning. Do not use this product in a situation where human life may be affected. If this product is used in a clean room or a place where reliability or control accuracy is particularly required, please contact our sales representative. Azbil Corporation will not bear any responsibility for the results produced by the operators.












Warnings and Cautions

	WARNING	Alerts users that improper handling may cause death or serious injury.
	CAUTION	Alerts users that improper handling may cause minor injury or material loss.

Signs







	Alerts users possible hazardous conditions caused by erroneous operation or erroneous use. The symbol inside \triangle indicates the specific type of danger. (For example, the sign on the left warns of the risk of electric shock.)
	Notifies users that specific actions are prohibited to prevent possible danger. The symbol inside \otimes graphically indicates the prohibited action. (For example, the sign on the left notifies that disassembly is prohibited.)
	Instructs users to carry out a specific obligatory action to prevent possible danger. The symbol inside \bullet graphically indicates the actual action to be carried out. (For example, the sign on the left indicates general instructions.)

 WARNING	
	Before wiring and maintenance, be sure to turn off the power to the product. Failure to do so might cause electric shock.
	Do not disassemble the spring unit of the product. The spring unit might rapidly rotate or jump out of the actuator, resulting in serious injury.

 CAUTION (1/2)	
	Store the products in package. Storing unpackaged products might damage or stain the products.
	Do not send shock to the product. Doing so might damage the product.
	Install and use the product in a location that meets the operating conditions (temperature, humidity, power, vibration, shock, mounting direction, atmospheric condition, etc.) as listed in the specifications. Failure to do so might cause fire or device failure.
	Take anti-lightning measures based on regional and building characteristics. Lightning might cause fire or critical damage to the product without the anti-lightning measures.
	Do not install the product in an environment with high heat radiation. High heat radiation might cause malfunction of the actuator.
	Do not use the product in an atmosphere containing corrosive gas. Doing so might damage the actuator or its components.
	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
	All wiring must comply with applicable codes and ordinances.
	Provide a circuit breaker for the power to the product.
	Provide a circuit protector (e.g., a fuse, cut-off device) for the control panel to ensure your safety.

 CAUTION



(2/2)

	If more than the rated power voltage is applied to the product, replace the product with new one for your safety. Failure to do so might cause fire.
	Do not use the product for an application that requires extremely frequent open/close operations. Doing so might cause fire or device failure.
	Do not place your hand around the product or bring your face close to the product. The product might rotate due to inappropriate installation, malfunction, or damage, causing injury.
	Do not touch the moving parts of the product. Doing so might cause injury.
	Do not disassemble the product. Doing so might cause electric shock or device failure.
	Dispose of the product as industrial waste in accordance with your local regulations. Do not reuse all or part of this product.

IMPORTANT:

- After installation, check fully open, shut-off, and spring-return operations of the damper actuator.
- Check that the damper shaft is held by the shaft clamp without slipping inside the clamp, and that the actuator is securely attached to the universal bracket when the actuator closes the damper from fully open position to fully closed position or opens the damper from fully closed position to fully open position..

Specifications

Item		Specification	
Rated power supply voltage		24 V AC, 50 Hz/60 Hz	
Operating voltage range		19.2 V AC to 28.8 V AC	
Power consumption	Running	7 W, 7 VA	
	Holding	3.5 W	
Angle of rotation		Max. 95° (Max. limit is adjustable from 33 % to 100 %.)	
Running time	Motor (0→100 % position)	Approx. 75 s	
	Spring return (100→0 % position)	Approx. 25 s	
Torque	Running	20 N·m	
	Holding	20 N·m	
	Spring return	20 N·m	
Environmental conditions	Rated operating conditions	Ambient temperature	-20 °C to 50 °C
		Ambient humidity	95 %RH (non-condensing)
		Vibration	4.9 m/s ² (10 Hz to 150 Hz)
	Transport/storage conditions	Ambient temperature	-20 °C to 60 °C
		Ambient humidity	95 %RH or less (non-condensing)
Vibration	9.8 m/s ² (10 Hz to 150 Hz)		
Protection rating		IEC IP54 (dust-proof and splash-proof) with the cable conduit facing downward * Do not use the actuator outdoors exposed to rain.	
Cable	Power	0.75 mm ² x 2 cores, approx. 1 m long	
	Auxiliary switch	0.75 mm ² x 6 cores, approx. 1 m long	
Materials	Housing	Polycarbonate resin	
	Clamp	Galvanized steel	
	Universal bracket	Galvanized steel plate	
Color	Housing	Gray	
Weight		Approx. 2.4 kg	
Applicable damper shaft		 10 mm to 25.4 mm, 15 mm long or longer  10 mm to 25.4 mm, 15 mm long or longer	
Withstand voltage	Between case and cable	1 mA or less at 500 V AC for 1 min.	
Insulation resistance	Between case and cable	100 MΩ or higher at 500 V DC	
Auxiliary switches		SPDT x 2 (at 10 % and 10–90 %) 1 mA to 3 (0.5) A, 250 V AC or lower (resistive load: 3A, inductive load: 0.5A)	
Accessories		Universal bracket x 1 (Part No. 12596-00001) Plastic bag for protection M4 tapping screws x 2 Crank handle for manual operation x 1 Installation instruction sheet (71382-00001.A) x 1	
Optional items (Order separately.)	Auxiliary device	Transformer (if needed)	
	Attachment	Attachment (Model Z-AF) for replacing the former models*	

IEC: International Electrotechnical Commission

Note:

* Mounting dimensions of Model MY6055B2001 differ from the mounting dimensions of Model MY6045 series. This attachment allows to replace Model MY6045 series with Model MY6055B2001 without changing the mounting position of the universal bracket.

Dimensions and Maintenance Clearance

IMPORTANT:
 Besides the below maintenance clearance, leave enough clearance for a tool, such as a torque wrench, to tighten the hexagonal nuts of the shaft clamp.

Side view

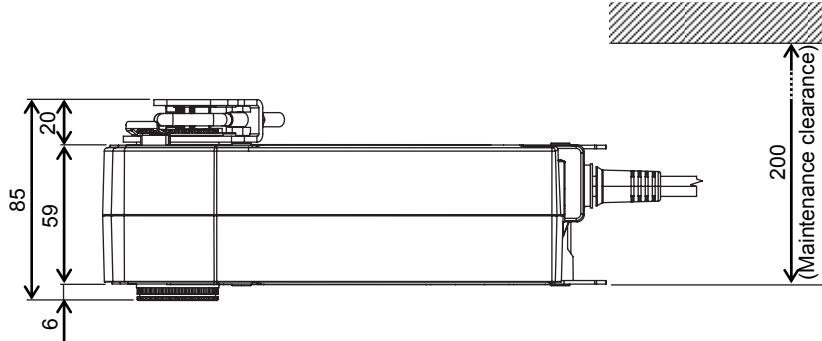


Figure 1. Dimensions and maintenance clearance (mm): Side view

Front view

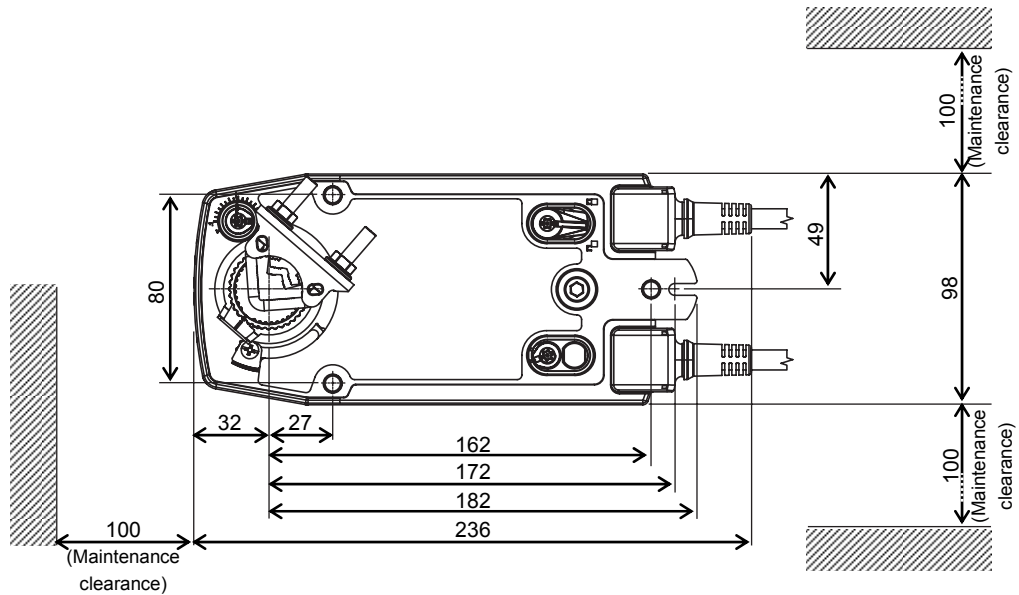


Figure 2. Dimensions and maintenance clearance (mm): Front view

Universal bracket (Part No. 12596-00001)

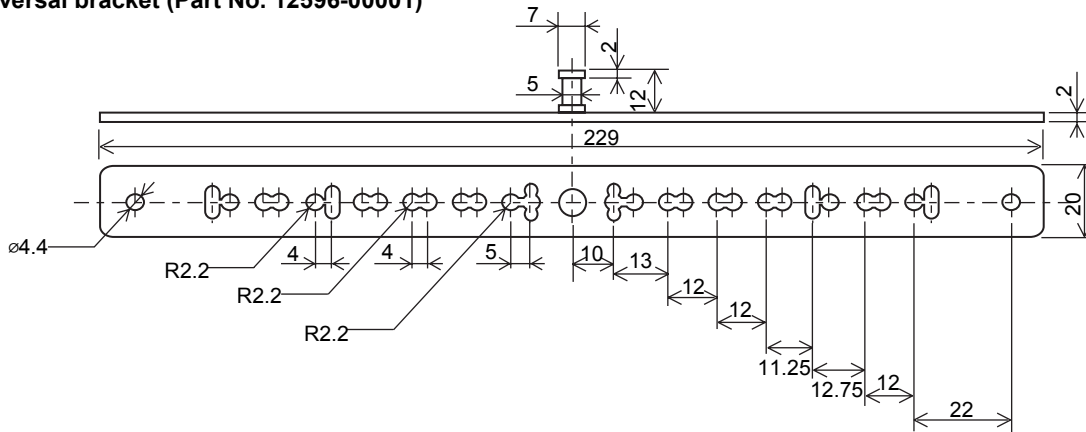


Figure 3. Dimensions (mm): Universal bracket

Parts Identifications

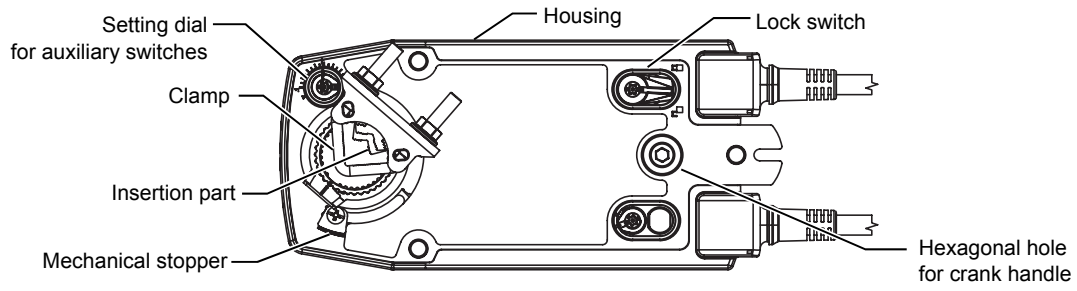


Figure 4. Parts identifications

Installation

⚠ CAUTION	
⊘	Do not send shock to the product. Doing so might damage the product.
❗	Install and use the product in a location that meets the operating conditions (temperature, humidity, power, vibration, shock, mounting direction, atmospheric condition, etc.) as listed in the specifications. Failure to do so might cause fire or device failure.
⚡	Take anti-lightning measures based on regional and building characteristics. Lightning might cause fire or critical damage to the product without the anti-lightning measures.
⊘	Do not install the product in an environment with high heat radiation. High heat radiation might cause malfunction of the actuator.
⊘	Do not use the product in an atmosphere containing corrosive gas. Doing so might damage the actuator or its components.
❗	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.

IMPORTANT:

- Avoid application that keeps the actuator open and close operations excessively frequent.
- Meet the actuator rotating direction with the damper rotating direction.
- For perfect installation, firmly tighten the screws of the actuator without loose connection.
- Leave clearance for maintenance as shown in Figs. 1 and 2. Besides, leave a clearance for a tool (e.g., torque wrench) to tighten the hexagonal nuts of the clamp.

Prior to installation

- 1) Check the shape and size of the damper shaft.
Depending on the shape and size of the shaft, the insertion part of the clamp needs to be removed. See the **Removal of the clamp insertion part** section.

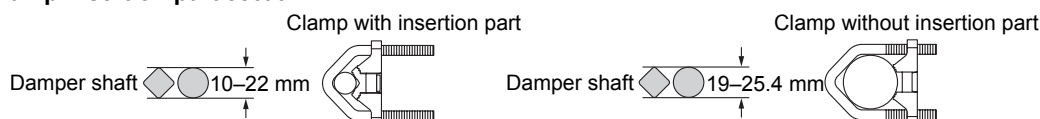


Figure 5. Clamp types corresponding to shape and size of damper shaft

- 2) Check the length of the damper shaft.
Installation steps differ depending on the length of the damper shaft.
- 3) Check the rotating direction of the damper shaft and meet the actuator rotating direction with the shaft rotating direction.
Actuator mounting orientation differ depending on the damper shaft rotating direction.
Spring-return direction of the actuator is indicated with "L" (left) or "R" (right) printed on the actuator front or rear face. "L" face must face the front for the counterclockwise spring-return direction, and "R" face must face the front for the clockwise spring-return direction.

Installation steps:

Mounting on minimum of 85 mm long damper shaft

For mounting the actuator on the damper shaft rotating counterclockwise ("L" direction) to close, follow the steps 1) through 4).

For mounting the actuator on the damper shaft rotating clockwise ("R" direction) to close, follow the below instruction **Mounting on the damper shaft rotating clockwise to close** first, then go to the steps 1) through 4).

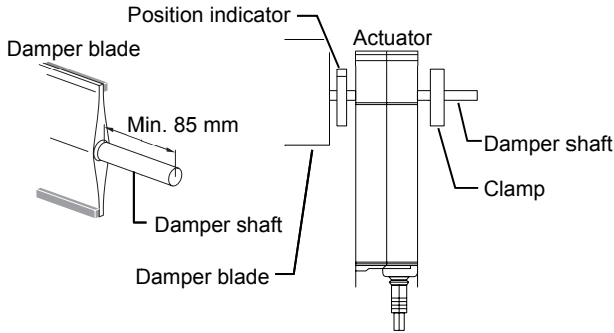


Figure 6. Installation image for min. 85 mm long damper shaft

Mounting on the damper shaft rotating clockwise to close

Follow the below instructions to mount the actuator rotating clockwise ("R" direction).

1. Pull out the C-clip and remove the position indicator from the "R" face of the actuator.
2. Pull out the C-clip and remove the clamp from the "L" face of the actuator.
3. Meet the mark of the clamp with the mark on the shaft mounting hole, and attach the clamp to the "R" face.
4. Fix the clamp with the C-clip pulled out at the step 2.
5. Attach the position indicator to the "L" face.
6. Fix the position indicator with the C-clip pulled out at the step 1.
7. Unscrew the M4 screw of the mechanical stopper on the "L" face and remove the mechanical stopper.
8. Attach the mechanical stopper to the full-open position on the "R" face with the M4 screw.

- 1) Mount the actuator on the damper shaft. Position the actuator as near the damper blade as possible, but do not allow the actuator to touch the damper.

Note:

* Check the actuator spring-return direction. The "L" face of the actuator must face the front for damper shaft rotating counterclockwise to close, and the "R" face must face the front for the damper shaft rotating clockwise to close.

- 2) Temporarily fix the actuator. Position the actuator mounting hole line parallel to the damper shaft, as shown in Fig. 9 and tighten the hexagonal nuts of the clamp.

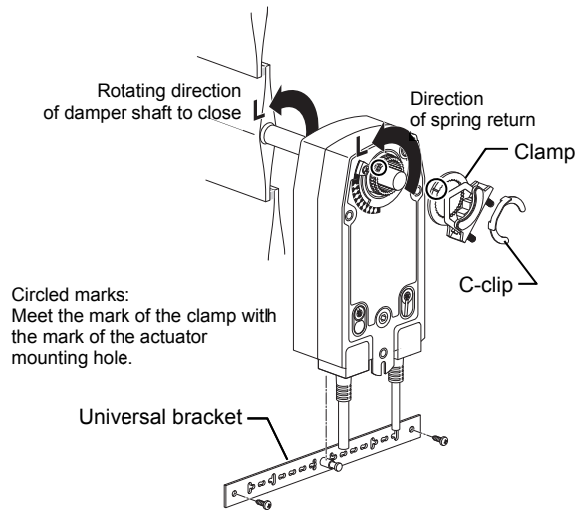


Figure 7. Temporary installation for min. 85 mm long damper shaft (counterclockwise rotation for closing)

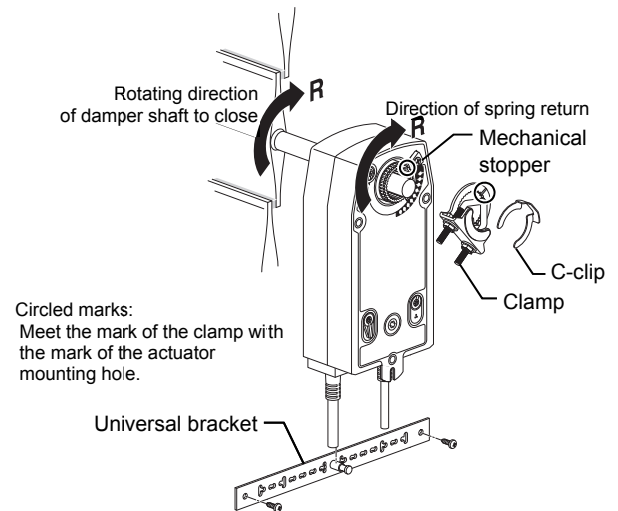
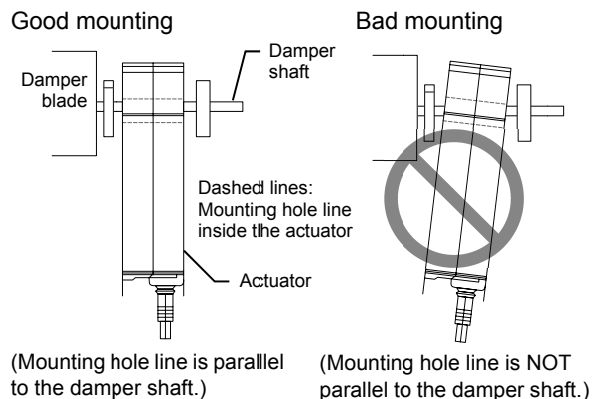


Figure 8. Temporary installation for min. 85 mm long damper shaft (clockwise rotation for closing)



(Mounting hole line is parallel to the damper shaft.) (Mounting hole line is NOT parallel to the damper shaft.)

Figure 9. Good and bad mounting orientation for min. 85 mm long damper shaft

- 3) Attach the universal bracket (accessory) to the duct. Position the universal bracket so that its mounting screws do not touch the damper blade.

<Precautions for mounting the universal bracket>
Follow the below instructions for bending the universal bracket at the specified positions to mount.

- a. Position the actuator on the damper shaft as near the damper blade as possible in order to bend the universal bracket as little as possible.
- b. Bend the universal bracket at the specified positions (once for each position). Note that the bending angle must be 45° or less. See the figure below.

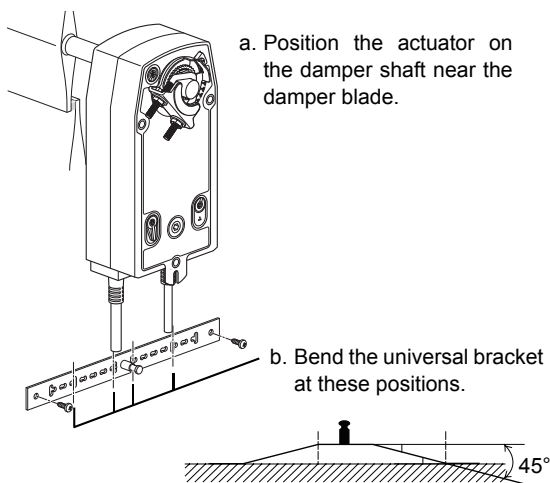


Figure 10. Bending the universal bracket

- 4) Fix the actuator with the universal bracket on the duct. Insert the pin of the universal bracket into the notch of the actuator to fix the actuator on the duct.

Note:

- * The universal bracket prevents the actuator from rolling.
- * The actuator will slightly pitch when actuating the damper shaft.

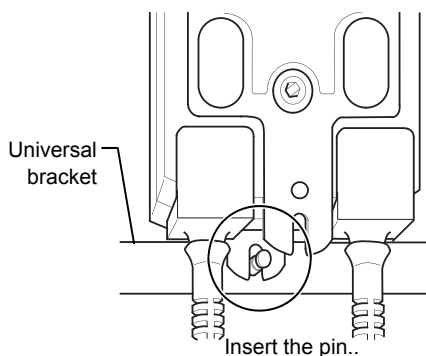


Figure 11. Fixing the actuator with the universal bracket

Jump to the **Installation steps: Common to any length of the damper shaft** section.

Installation steps:

Mounting on 15–85 mm long damper shaft

Installation steps differ depending on the damper shaft rotating direction. See **3)** of **Prior to installation** section, and go to the corresponding installation steps.

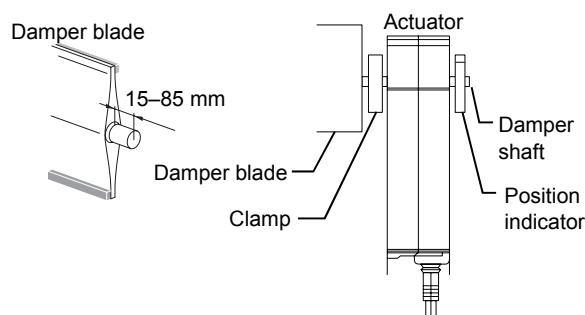


Figure 12. Installation image for 15–85 mm long damper shaft

Mounting on the damper shaft rotating counterclockwise ("L" direction) to close

- 1) Pull out the C-clip and remove the clamp from the "L" face of the actuator.
- 2) Attach the clamp to the damper shaft as near the damper blade as possible. (Make sure that the clamp does not touch the damper.)
- 3) Temporarily fix the clamp on the damper shaft. Set the clamp mounting orientation so that the mounting hole line of the actuator to be mounted at the steps 7) and 8) is parallel to the damper shaft, and tighten the hexagonal nuts of the clamp.
- 4) Pull out the C-clip and remove the position indicator from the "R" face of the actuator.
- 5) Meet the mark of the position indicator with the mark on the shaft mounting hole, and attach the position indicator to the "L" face of the actuator.
- 6) Fix the position indicator with the C-clip pulled out at the step 4).
- 7) Mount the actuator on the damper shaft so that the "L" face of the actuator faces the front.

- 8) Fix the clamp on the "R" face of the actuator with the C-clip pulled out at the step 1).

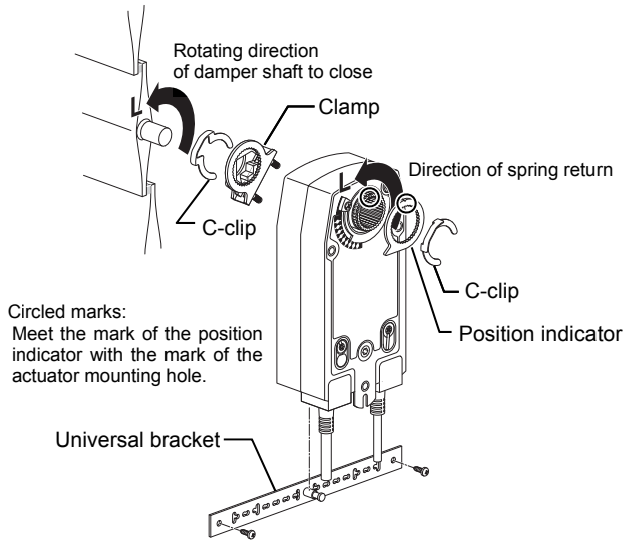


Figure 13. Temporary installation for 15–85 mm long damper shaft (counterclockwise rotation for closing)

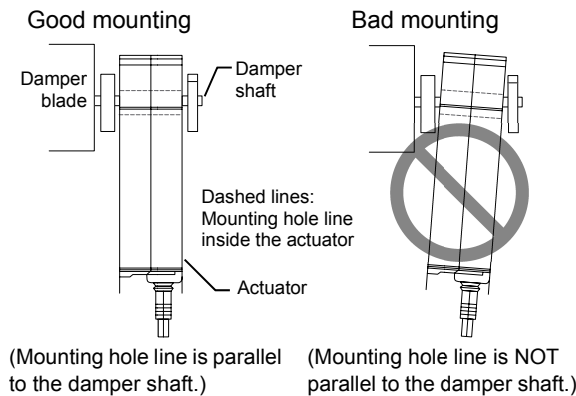


Figure 14. Good and bad mounting orientation for 15–85 mm long damper shaft

- 9) Attach the universal bracket (accessory) to the duct. Position the universal bracket so that its mounting screws do not touch the damper blade.

Note:

- * To bend the universal bracket for mounting on the duct, see the following:

Mounting on the damper shaft rotating clockwise to close
3) <Precautions for mounting the universal bracket>

- 10) Fix the actuator with the universal bracket on the duct. Insert the pin of the universal bracket into the notch of the actuator to fix the actuator on the duct. See Fig. 11.

Note:

- * The universal bracket prevents the actuator from rolling.
- * The actuator will slightly pitch when actuating the damper shaft.

Jump to the **Installation steps: Common to any length of the damper shaft** section.

Mounting on the damper shaft rotating clockwise ("R" direction) to close

- 1) Pull out the C-clip and remove the clamp from the "L" face of the actuator.
- 2) Attach the clamp to the damper shaft as near the damper blade as possible. (Make sure that the clamp does not touch the damper.)
- 3) Temporarily fix the clamp on the damper shaft. Set the clamp mounting orientation so that the mounting hole line of the actuator to be mounted at the steps 6) and 7) is parallel to the damper shaft, and tighten the hexagonal nuts of the clamp.
- 4) Unscrew the M4 screw of the mechanical stopper on the "L" face and remove the mechanical stopper.
- 5) Attach the mechanical stopper to the full-open position on the "R" face with the M4 screw.
- 6) Mount the actuator on the damper shaft so that the "R" face of the actuator faces the front
- 7) Fix the clamp on the "R" face of the actuator with the C-clip pulled out at the step 1). See Fig. 14 for the actuator mounting orientation.

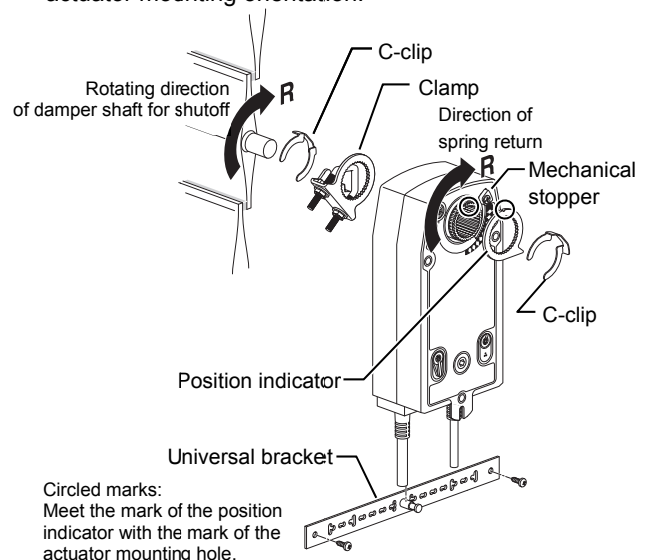


Figure 15. Temporary installation for 15–85 mm long damper shaft (clockwise rotation for closing)

- 8) Attach the universal bracket (accessory) to the duct. Position the universal bracket so that its mounting screws do not touch the damper blade.

Note:

- * To bend the universal bracket for mounting on the duct, see the following:

Mounting on the damper shaft rotating clockwise to close
3) <Precautions for mounting the universal bracket>

- 9) Fix the actuator with the universal bracket on the duct. Insert the pin of the universal bracket into the notch of the actuator to fix the actuator on the duct. See Fig. 11.

Note:

- * The universal bracket prevents the actuator from rolling.
- * The actuator will slightly pitch when actuating the damper shaft.

Jump to the **Installation steps: Common to any length of the damper shaft** section.

Installation steps:

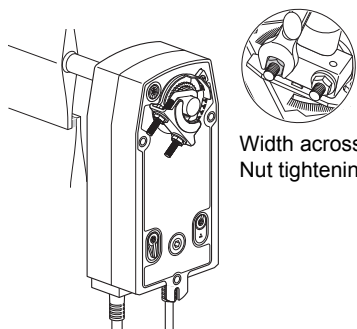
Common to any length of the damper shaft for each rotation.

The following installation steps are common to the both min. 85 mm long and 15–85 mm long damper shafts rotating clockwise and counterclockwise. After completing the before-mentioned steps, follow the below steps to complete the installation.

- 1) Check that the damper shaft is in the fully closed position. Then, tighten the hexagonal nuts (with 10 mm width across flats) to completely mount the actuator on the damper shaft. Note that nut tightening torque is 10 N·m.

IMPORTANT:

Tighten the hexagonal nuts of the clamp with 10 N·m torque. Smaller than the 10 N·m torque might cause loose connection of the clamp on the damper shaft, and the actuator therefore may not be able to fully open or close the damper. Larger than the 10 N·m torque might wear out the thread of the hexagonal nuts/clamp.



Width across flats of the nuts: 10 mm
Nut tightening torque: 10 N·m

Figure 16. Tightening the nuts of the clamp

IMPORTANT:

- After installation, check fully open, shut-off, and spring-return operations of the actuator.
- Check that the damper shaft is held by the shaft clamp without slipping inside the clamp, and that the actuator is securely attached to the universal bracket.

Removal of clamp insertion part

- 1) Pull out the C-clip and remove the clamp from the actuator.
- 2) Remove the black resin cap attached to the clamp.
Note:
* Be sure to keep the removed cap.
The cap will be attached to the clamp again.

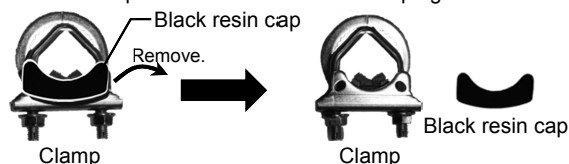


Figure 17. Removing the black resin cap

- 3) Pull out the insertion part.

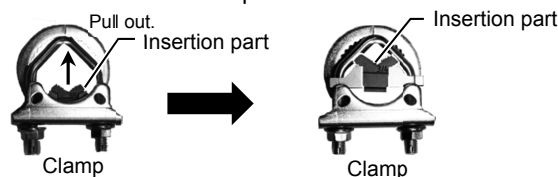


Figure 18. Pulling the insertion part

- 4) Remove the insertion part from the holder.

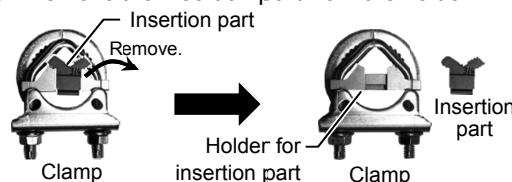


Figure 19. Removing the insertion part

- 5) Press the holder for the insertion part back in the position.

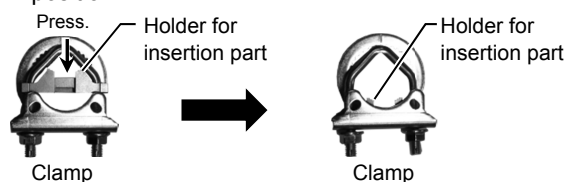


Figure 20. Pressing the holder for the insertion part

- 6) Attach the black resin cap (removed at the step 2)) to the clamp.

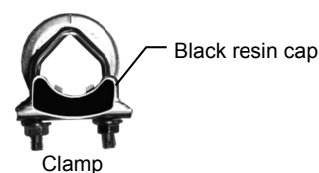


Figure 21. Attaching the black resin cap

- 7) Meet the mark of the clamp with the mark of the mounting holder and attach the clamp to the actuator.
- 8) Fix the clamp with the C-clip pulled out at the step 1).

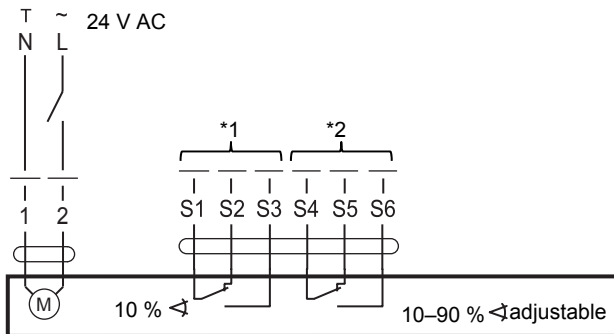
Wiring

⚠ WARNING	
⚡	Before wiring and maintenance, be sure to turn off the power to the product. Failure to do so might cause electric shock.

⚠ CAUTION	
!	Installation and wiring must be performed by qualified personnel in accordance with all applicable safety standards.
!	All wiring must comply with applicable codes and ordinances.
!	Provide a circuit breaker for the power to the product.
!	Provide a circuit protector (e.g., a fuse, cut-off device) for the control panel to ensure your safety.

Wiring diagrams

Wiring numbers are indicated on the lead wire insulating jackets.



Note:

- *1 S1-S2 contact is ON at 10 % or smaller position.
- *2 Position for S4-S5 contact is adjustable within 10 % to 90 % range. S4-S5 contact is ON at the set position or smaller than the set position.

Figure 22. Wiring diagram

Setting (Angle of Rotation)

⚠ WARNING	
⚡	Before wiring and maintenance, be sure to turn off the power to the product. Failure to do so might cause electric shock.
⚠	Do not disassemble the spring unit of the product. The spring unit might rapidly rotate or jump out of the actuator, resulting in serious injury.

⚠ CAUTION	
⚠	If more than the rated power voltage is applied to the product, replace the product with new one for your safety. Failure to do so might cause fire.
⊘	Do not place your hand around the product or bring your face close to the product. The product might rotate due to inappropriate installation, malfunction, or damage, causing injury.
⊘	Do not touch the moving parts of the product. Doing so might cause injury.

IMPORTANT:	
<ul style="list-style-type: none"> • After changing the mechanical stopper position, make sure that the damper shaft is stopped at the changed mechanical stopper position. • Check that the set screws of the mechanical stopper are not loose. 	

Setting the maximum position

To set the maximum angle to 95° or smaller, change the mechanical stopper position within 33–100 % range. Mechanical stopper changed to the desired position must be fixed with the M4 screw.

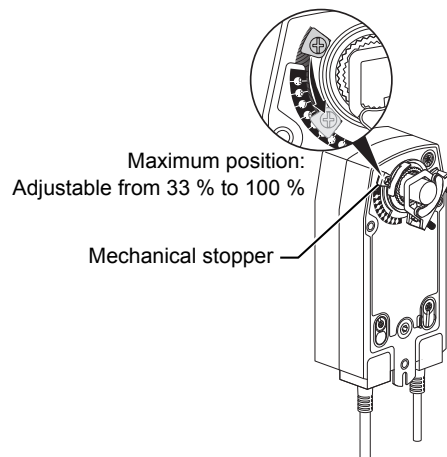







Figure 23. Setting the angle of rotation

Manual Override

	WARNING
	<p>Before wiring and maintenance, be sure to turn off the power to the product. Failure to do so might cause electric shock.</p>

	CAUTION
	<p>Do not place your hand around the product or bring your face close to the product.</p>
	<p>The product might rotate due to inappropriate installation, malfunction, or damage, causing injury.</p> <p>Do not touch the moving parts of the product. Doing so might cause injury.</p>

To lock the damper at the desired position, use the crank handle (accessory).

- 1) Insert the crank handle into the hexagonal hole provided on the "L" or "R" face of the actuator, and rotate the crank handle to the direction the arrow (printed above the hexagonal hole) indicates.

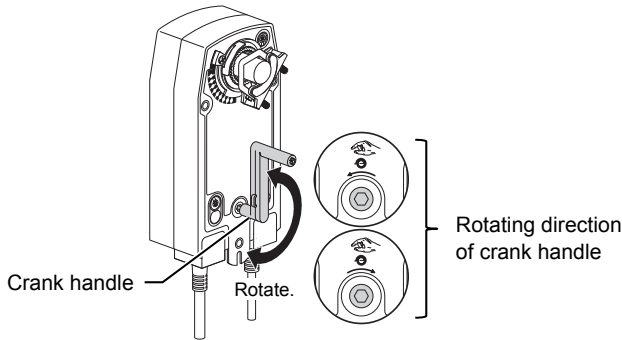


Figure 24. Manually opening the damper

- 2) When the damper blade reaches the desired position, lock the actuator with the lock switch and remove the crank handle.

IMPORTANT:	
<p>After using the crank handle, attach the crank handle as "A" in the below figure shows. Completely attach the crank handle to the hexagonal hole so that it does not come off.</p>	

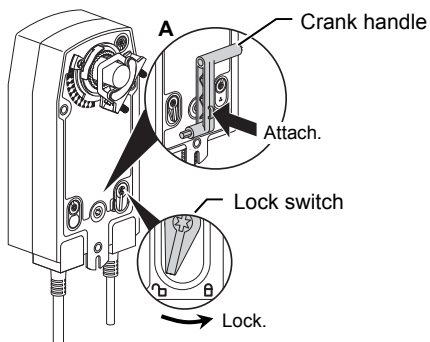


Figure 25. Locking the damper position

Auxiliary Switch Setting

The actuator is equipped with two SPDT switches (fixed at 10 % position and adjustable from 10 to 90 % position). To set the adjustable switch, attach the crank handle to the auxiliary switch setting dial and rotate the dial to the setting position. After setting the dial, make sure that the auxiliary switch operates at the set position.

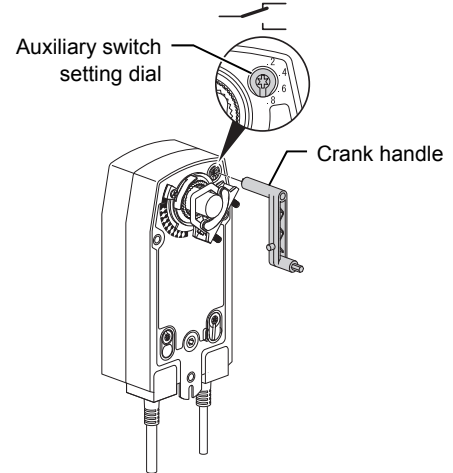


Figure 26. Setting the auxiliary switch

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Specifications are subject to change without notice.

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