

# Honeywell Home

# ZD Series Dampers



NOTE: Pages 1-4 are for current ZD damper models. These models have "TZ" at the end of the model number.  
Pages 5-8 are for legacy ZD series dampers.

## PRODUCT DATA



## APPLICATION

The ZD is a power close, and spring open damper. It has a 24-volt, spring-return, power-closed damper motor used to control circulating air in heating, cooling and ventilating systems. It is used when a normally-open damper is required. The ZD is typically used with Honeywell Home TrueZONE zone panels.

## FEATURES

- Taping flange and non-interfering set screw.
- High temperature outer plastic for hot environments.
- Redesigned all metal drive train gears.
- Front facing display with LED Indication light for open and close.
- Adjustable damper position range stops.
- Can be mounted on the side or bottom of the duct, as the application requires. (Actuator mounted on second damper dimension listed.)
- Quiet operation.

## SPECIFICATIONS

### IMPORTANT

*The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not exactly match the listed specifications. Also, this product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.*

**Dampers Frame:** Solid construction using extruded aluminum frame and blades.

**Available Damper Sizes:** See Table 1.

**Damper Dimensions:** All ZD dampers are actually sized 5/32 in. smaller than the listed size to ensure correct fit. All ZD dampers are 4 in. thick.

**M847D-ZONE Actuator Motor Electrical Rating:**  
24 Vac, 60 Hz, 8 VA.

**Motor Electrical Connection:** Push terminals.

**Motor Nominal Angular Rotation:** 90°.

**Motor Torque:** Minimum 71 in.-oz. (500 milli-newton meters) output torque available when motor is energized and device is at the spring return initial start position.

**Nominal Motor Timing at 77 °F (25 °C) Ambient:**  
Energized at rated load: 30 seconds.  
De-energized (spring return): 10 seconds.

**Motor Ambient Temperature Rating:**  
40 to 140 °F (5 to 60 °C).

**Motor Shaft Rotation Direction:** Clockwise, when energized and viewed from the base or shaft end.

**Motor Mounting Means:** Direct connection to damper shaft.

**Motor Mounting Position:** Multi-prise.

**Motor Dimensions:** See Fig. 1.



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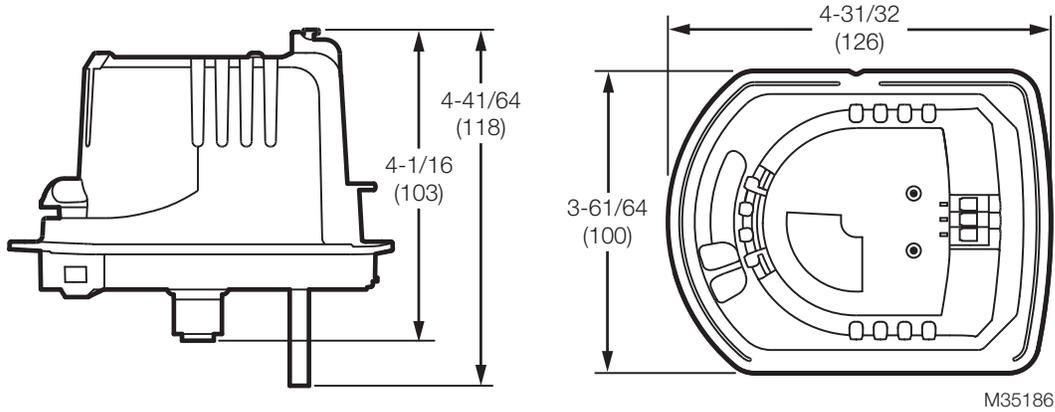


Fig. 1. Motor dimensions in inches (mm).

## ORDERING INSTRUCTIONS

- Order ZD (dimension 1) x (dimension 2) TZ.  
Actuator is always mounted on dimension 2 side.  
All ZD dampers are 4 in. thick.
  - **For example**, ZD10x8TZ is a 10 in. x 8 in. damper with the actuator on the 8 in. side; but a ZD8x10TZ is a 8 in. x 10 in. damper that has the actuator on the 10 in. side.
  - Note that the damper can be installed in any orientation (mounting side can be on either the bottom or the side of the duct).

Table 1. Available sizes.

	6 in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.	20 in.	22 in.	24 in.	26 in.	28 in.
6 in.	ZD6X6TZ	ZD6X8TZ	ZD6X10TZ	ZD6X12TZ	ZD6X14TZ	ZD6X16TZ	ZD6X18TZ	ZD6X20TZ	ZD6X22TZ	ZD6X24TZ	ZD6X26TZ	ZD6X28TZ
8 in.	ZD8X6TZ	ZD8X8TZ	ZD8X10TZ	ZD8X12TZ	ZD8X14TZ	ZD8X16TZ	ZD8X18TZ	ZD8X20TZ	ZD8X22TZ	ZD8X24TZ	ZD8X26TZ	ZD8X28TZ
10 in.	ZD10X6TZ	ZD10X8TZ	ZD10X10TZ	ZD10X12TZ	ZD10X14TZ	ZD10X16TZ	ZD10X18TZ	ZD10X20TZ	ZD10X22TZ	ZD10X24TZ	ZD10X26TZ	ZD10X28TZ
12 in.	ZD12X6TZ	ZD12X8TZ	ZD12X10TZ	ZD12X12TZ	ZD12X14TZ	ZD12X16TZ	ZD12X18TZ	ZD12X20TZ	ZD12X22TZ	ZD12X24TZ	ZD12X26TZ	ZD12X28TZ
14 in.	ZD14X6TZ	ZD14X8TZ	ZD14X10TZ	ZD14X12TZ	ZD14X14TZ	ZD14X16TZ	ZD14X18TZ	ZD14X20TZ	ZD14X22TZ	ZD14X24TZ	ZD14X26TZ	ZD14X28TZ
16 in.	ZD16X6TZ	ZD16X8TZ	ZD16X10TZ	ZD16X12TZ	ZD16X14TZ	ZD16X16TZ	ZD16X18TZ	ZD16X20TZ	ZD16X22TZ	ZD16X24TZ	ZD16X26TZ	N/A
18 in.	ZD18X6TZ	ZD18X8TZ	ZD18X10TZ	ZD18X12TZ	ZD18X14TZ	ZD18X16TZ	ZD18X18TZ	ZD18X20TZ	ZD18X22TZ	ZD18X24TZ	ZD18X26TZ	N/A
20 in.	ZD20X6TZ	ZD20X8TZ	ZD20X10TZ	ZD20X12TZ	ZD20X14TZ	ZD20X16TZ	ZD20X18TZ	ZD20X20TZ	ZD20X22TZ	ZD20X24TZ	N/A	N/A
22 in.	ZD22X6TZ	ZD22X8TZ	ZD22X10TZ	ZD22X12TZ	ZD22X14TZ	ZD22X16TZ	ZD22X18TZ	ZD22X20TZ	ZD22X22TZ	ZD22X24TZ	N/A	N/A
24 in.	ZD24X6TZ	ZD24X8TZ	ZD24X10TZ	ZD24X12TZ	ZD24X14TZ	ZD24X16TZ	ZD24X18TZ	ZD24X20TZ	ZD24X22TZ	ZD24X24TZ	N/A	N/A
26 in.	ZD26X6TZ	ZD26X8TZ	ZD26X10TZ	ZD26X12TZ	ZD26X14TZ	ZD26X16TZ	ZD26X18TZ	ZD26X20TZ	N/A	N/A	N/A	N/A
28 in.	ZD28X6TZ	ZD28X8TZ	ZD28X10TZ	ZD28X12TZ	ZD28X14TZ	ZD28X16TZ	N/A	ZD28X20TZ	N/A	N/A	N/A	N/A

# INSTALLATION

## When Installing this Product...

1. Read these instructions carefully. Failure to follow these instructions can damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. All wiring must comply with local electrical codes, ordinances, and regulations.
5. After completing installation, use these instructions to check out the product operation.

## Planning the Installation

### Selecting a Location

Select a location for the zone dampers that is at least three feet from the HVAC unit plenum in the air duct takeoff to the respective zone and is easily accessible for checkout and maintenance.

The ZD comes complete and ready for installation. The motor and linkage are factory-assembled to the damper. The damper is assembled for installation and wiring to the control panel.

### Selecting Damper Size

To ensure correct operation, be sure to select the correct zone damper size for the air duct:

#### IMPORTANT

*Be aware that damper sizes are built 5/32 in. smaller than the listed dimensional sizes. Actuator is mounted on the second dimension listed.*

- If the damper is forced into an undersized air duct, the excess pressure can jam the damper blades and cause improper operation.
- When a small percentage of continuous flow is desired in a zone, even when the damper blades are closed, adjust motor closed position to be slightly open to maintain desired air flow.

### Selecting Location with Humidifier Installed

#### IMPORTANT

*Excessive lime or mineral deposits can accumulate on damper blades and cause improper operation when spray or atomizing type humidifiers are installed in the furnace plenum or air supply duct with the zone dampers.*

- Spray or atomizer type humidifiers that are installed in the furnace plenum or air supply duct are not recommended.
- Evaporative type humidifiers are recommended.

## Installing the Damper

#### IMPORTANT

- Install dampers into a squared air duct.
- Do not weld dampers to the air ducts.
- Do not force dampers into undersized air ducts. Excess pressure can damage damper blades.
- Be sure high limit setting is less than 200 °F (93 °C). Higher settings can damage the electric actuator.

1. Be sure the ZD is correctly sized to the air duct (see Selecting Damper Size section).
2. Select a ZD location that is three feet from the furnace plenum.
3. Cut a 4-in. (102 mm) opening in the accessible side of the air duct at the location selected; ensure the opening of the air duct is cut fully from seam to seam.
4. Secure the ZD mounting plate to the air duct with the self-tapping sheet metal screws provided.

## WIRING

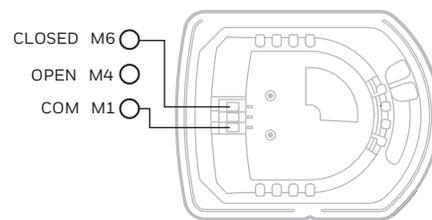


### CAUTION

**Personal Electrical Shock Hazard.**  
**Can cause electrical shock or equipment damage.**

Disconnect power before beginning installation.

The ZD has a 24 Vac, 50/60 cycle, 8 VA max. motor. The ZD is wired to terminals M1 and M6 for power closed/spring return open. See Fig. 2. The ZD is a spring return damper that requires 24 V to the two motor leads to power the damper closed. When power is removed from the motor, the damper springs back to its normally-open position.



NOTE: WHEN INSTALLING ON OLDER MASTERTROL BOARDS SUCH AS THE MARK V, JUMPER M2-M5 ON THE PANEL. M37925

Fig. 2. Power closed spring return open ZD wiring.

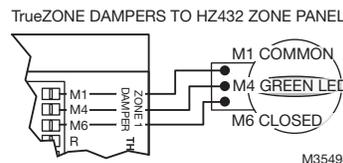


Fig. 3. 3-Wire Operation (Red and Green LEDs).

## Wiring Multiple Dampers

When the same zone controls two or more dampers, wire the dampers in parallel to terminals M1 and M6 on the zone control panel.

## Wiring a Motor

See Fig. 2 for typical motor wiring hookup.

- For 2 wire usage, wire M1 and M6 (Fig. 2).
- For 3 wire usage, break the plastic tab to access M4. See Fig. 3.

## Changing a Motor

**NOTE:** All ZD-series dampers (legacy and current models) can be used with the M847D-ZONE actuator.

- Disconnect the motor wiring.
- Loosen the large Allen set screw located between the faceplate and the motor coupling.
- Remove the motor.
- Ensure damper blades are in the open position with the set screw pointing toward the open position on the label.
- Attach new motor to the coupling; be sure that the standoff on the motor is positioned in the grommet on the faceplate and that the set screw is aligned with the motor shaft hole.
- Tighten the set screw.

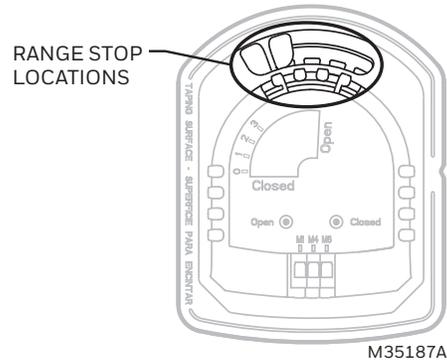
## Setting a Range Stop

Set the range stop to the desired position. Position 0 means fully closed.

**NOTE:** Range stops prevent full closure.

### Approximate ZD Bleed Rate.

Position	Bleed Rate
0	Closed
1	16%
2	30%
3	50%



**Fig. 4. TrueZONE Actuator range stop positions.**

## CHECKOUT

To check out the ZD:

- With 24 Vac applied to the M1 and M6 terminals, observe the motor powering the damper to the closed position.
- When energized, verify that the indicator in the window rotates from Open to Closed and the LED for Closed is lit.
- With power removed, observe the damper returning to the normally-open position.

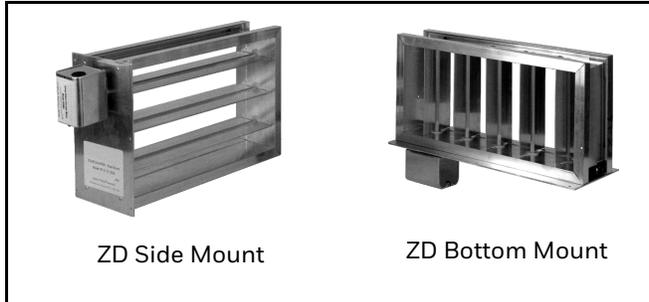
**NOTE:** To remove power, disconnect one wire from the motor.

- If the motor does not operate smoothly and without hesitation throughout the complete opening and closing stroke, examine the damper and the shaft for free rotation within the duct.
- If the opening and closing is not achieved, check that the range-stop setting is correct.



# Legacy ZD Series Dampers

**PRODUCT DATA**



ZD Side Mount

ZD Bottom Mount

## APPLICATION

The ZD is a power close, and spring open damper. It has a 24-volt, spring-return, power-closed damper motor used to control circulating air in heating, cooling and ventilating systems. It is used when a normally-open damper is required. The ZD is typically used with the TotalZone® Systems and other electronic mini-zone damper systems.

## FEATURES

- **Reliable spring-return motor.**
- **Fail-safe, normally-open operation.**
- **Strong 24-volt spring-return motor.**
- **Quiet operation with fewer blades.**
- **Simple, easy-to-wire, two-wire operation.**
- **Parallel blade design for low leakage performance.**
- **Easy slip-in design.**
- **Solid construction using extruded aluminum frame and blades.**
- **Can be mounted on the side or bottom of the duct, as the application requires.**

## SPECIFICATIONS

**IMPORTANT**

*The specifications given in this publication do not include normal manufacturing tolerances. Therefore, this unit may not exactly match the listed specifications. Also, this product is tested and calibrated under closely controlled conditions, and some minor differences in performance can be expected if those conditions are changed.*

**Available Damper Sizes:** Even sizes from 6 in. x 6 in. up to 36 in. x 36 in.

**Damper Dimensions:** All ZD dampers are actually sized 5/32 in. smaller than the listed size to ensure correct fit.

**Motor Electrical Rating:** 24 Vac, 60 Hz, 0.32 A.

**Motor Electrical Connection:** 4 in. leadwire.

**Motor Nominal Angular Rotation:** 90°.

**Motor Torque:** Minimum 71 in.-oz. (500 milli-newton meters) output torque available when motor is energized and device is at the spring return initial start position.

**Nominal Motor Timing at 77 °F (25 °C) Ambient:**

Energized at rated load: 30 seconds.

De-energized (spring return): 10 seconds.

**Motor Ambient Temperature Rating:**

40 to 140 °F (5 to 60 °C).

**Motor Finish:** Zinc-plated steel, anodized aluminum.

**Motor Shaft Rotation Direction:** Clockwise, when energized and viewed from the base or shaft end.

**Motor Mounting Means:** Direct connection to damper shaft.

**Motor Mounting Position:** Multi-prise.

**Motor Dimensions:** See Fig. 5.

NOTE: The motor specifications on pages 5-8 are for the original M847D1004 or M847D1012 actuators rather than the current M847D-ZONE actuators.

\* Nominal Device Dimensions (see Fig. 5).

	A	B	C
inches	2-3/8	3-3/8	3-1/2
mm	60	84.5	88

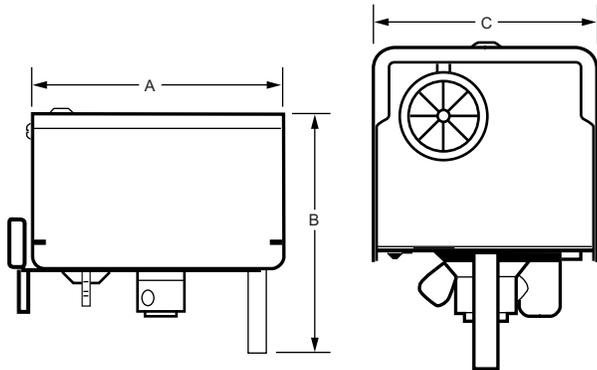


Fig. 5. Motor dimensions in inches (mm).

## INSTALLATION

### When Installing this Product...

1. Read these instructions carefully. Failure to follow these instructions can damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and on the product to make sure the product is suitable for your application.
3. Installer must be a trained, experienced service technician.
4. All wiring must comply with local electrical codes, ordinances, and regulations.
5. After completing installation, use these instructions to check out the product operation.

### Planning the Installation

#### Selecting a Location

Select a location for the zone dampers that is at least three feet from the HVAC unit plenum in the air duct takeoff to the respective zone and is easily accessible for checkout and maintenance.

The ZD comes complete and ready for installation. The motor and linkage are factory-assembled to the damper. The damper is assembled for installation and wiring to the control panel.

### Selecting Damper Size

To ensure correct operation, be sure to select the correct zone damper size for the air duct:

#### IMPORTANT

*Be aware that damper sizes are built 5/32 in. smaller than the listed dimensional sizes.*

- If the damper is forced into an undersized air duct, the excess pressure can jam the damper blades and cause improper operation.
- When a small percentage of continuous flow is desired in a zone, even when the damper blades are closed, adjust motor closed position to be slightly open to maintain desired air flow.

### Selecting Location with Humidifier Installed

#### IMPORTANT

*Excessive lime or mineral deposits can accumulate on damper blades and cause improper operation when spray or atomizing type humidifiers are installed in the furnace plenum or air supply duct with the zone dampers.*

- Spray or atomizer type humidifiers that are installed in the furnace plenum or air supply duct are not recommended.
- Evaporative type humidifiers are recommended.

### Installing the Damper

#### IMPORTANT

- Install dampers into a squared air duct.
- Do not weld dampers to the air ducts.
- Do not force dampers into undersized air ducts. Excess pressure can damage damper blades.
- Be sure high limit setting is less than 200 °F (93 °C). Higher settings can damage the electric actuator.

1. Be sure the ZD is correctly sized to the air duct (see Selecting Damper Size section).
2. Select a ZD location that is three feet from the furnace plenum.
3. Cut a 4-in. (102 mm) opening in the accessible side of the air duct at the location selected; ensure the opening of the air duct is cut fully from seam to seam.
4. Secure the ZD mounting plate to the air duct with the self-tapping sheet metal screws provided.

# WIRING



## CAUTION

**Personal Electrical Shock Hazard.**  
**Can cause electrical shock or equipment damage.**

Disconnect power before beginning installation.

The ZD has a 24 Vac, 50/60 cycle, 0.32 A motor. The ZD is wired to terminals M1 and M6 for power closed/spring return open. See Fig. 6. The ZD is a spring return damper that requires 24 V to the two motor leads to power the damper closed. When power is removed from the motor, the damper springs back to its normally-open position. When used with Networked Zoning, use closed and com terminals.

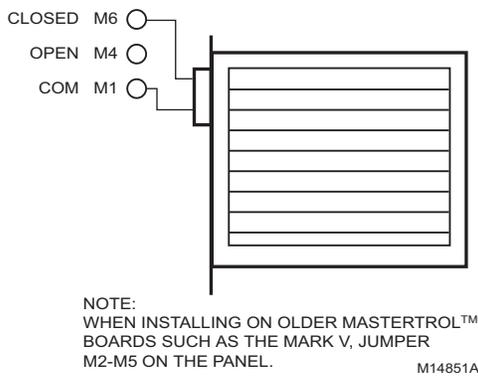


Fig. 6. Power closed spring return open ZD wiring.

## Wiring Multiple Dampers

When the same zone controls two or more dampers, wire the dampers in parallel to terminals M1 and M6 on the zone control panel.

## Wiring a Motor

See Fig. 6 for typical motor wiring hookup.

## Changing a Motor

NOTE: All ZD-series dampers (legacy and current models) can be used with the M847D-ZONE actuator.

1. Disconnect the motor wiring.
2. Loosen the large Allen set screw located between the faceplate and the motor coupling.
3. Remove the motor.
4. Ensure damper blades are in the open position with the set screw pointing toward the open position on the label.
5. Attach new motor to the coupling; be sure that the standoff on the motor is positioned in the grommet on the faceplate and that the set screw is aligned with the motor shaft hole.
6. Tighten the set screw.

## Adjusting a Motor

1. When viewed on end, the lower lever is normally positioned to the extreme left and the upper lever positioned to the extreme right. See Fig. 7. This position provides complete shutoff when the actuator is energized.
2. To prevent complete closure of the damper, loosen (do not remove) the wing nut on the bottom of the unit and move the upper lever to the left until the desired position is reached. Tighten the wing nut. In the extreme left position, the damper should stay open approximately 40° with the power on.
3. The lower lever is normally positioned to the left to allow the damper to fully open 90° when energized. See Fig. 7.
4. To restrict the air flow in the open position, loosen (do not remove) the wing nut and move the lower lever to the right until the desired position is reached. Tighten the wing nut. In the extreme right position, the damper should open approximately 50° with the power off.

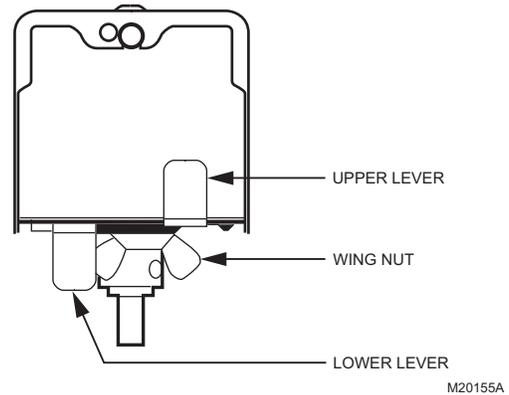


Fig. 7. Air flow adjustment.

## CHECKOUT

To check out the ZD:

1. With 24 Vac applied to the motor leads, observe the motor powering the damper to the closed position.
2. When energized, verify that the actuator connection coupling rotates in a clockwise direction (as viewed from the operator base end) and that the damper shaft turns with the coupling.
3. With power removed, observe the damper returning to the normally-open position.

NOTE: To remove power, disconnect one wire from the motor.

4. If the motor does not operate smoothly and without hesitation throughout the complete opening and closing stroke, examine the damper and the shaft for free rotation within the duct.
5. If the full opening and closing is not achieved, check that the lower adjustment lever is to the extreme left and the upper lever is to the extreme right. See Fig. 7.



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