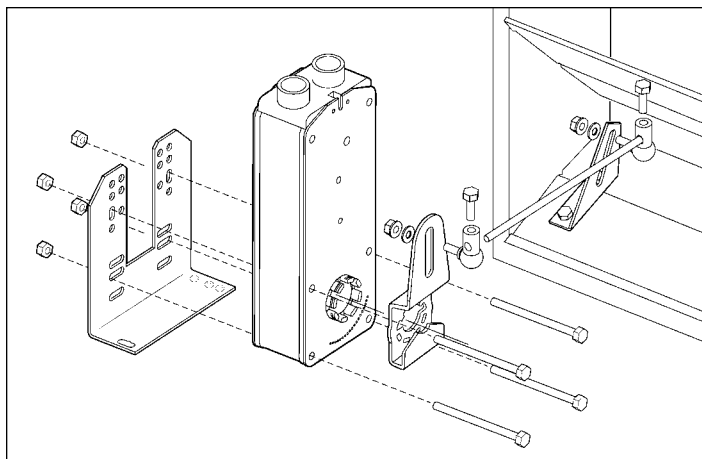
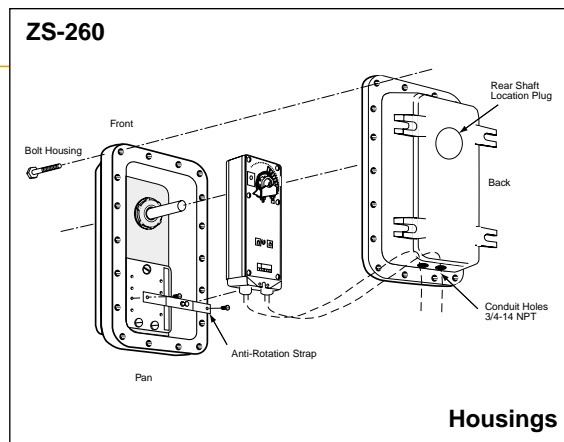


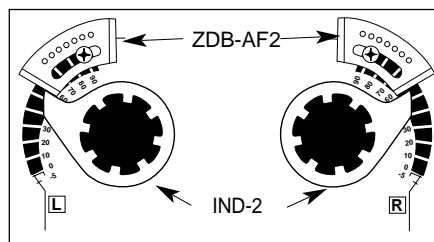
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For detailed installation instructions call 800-543-9038 • See the Belimo MOUNTING METHODS GUIDE for application information.

A CLOSER LOOK...

We'll help solve any application problem with a wide range of accessories and unparalleled customer service.

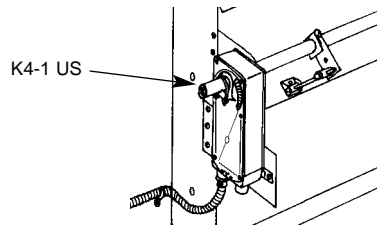


The Belimo Difference

- **Customer Commitment.**
Extensive product range. Competitive project pricing. Application assistance. Same-day shipments. Free technical support. Five year warranty.
- **Low Installation and Life-Cycle Cost.**
Easy installation. Accuracy and repeatability. Low power consumption. No maintenance.
- **Long Service Life.**
Components tested before assembly. Every product tested before shipment. 20+ years direct coupled actuator design.



K4-1 US



K4-1 US Jackshaft Clamp
For AF, NF and AM Series Actuators

Fits jackshafts up to 1.05". Retaining ring fixes clamp to actuator teeth.



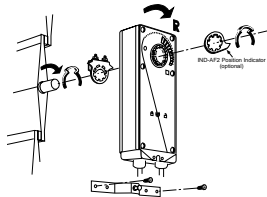
K4-H

K4-H Hex Shaft clamp
For AF, NF and AM Series Actuators

Fits hex shafts 3/8" to 5/8". Retaining ring fixes clamp to actuator teeth.



IND-AF2



IND-AF2 Damper Position Indicator
For AF and NF Series Actuators

For damper position indication in short-shaft installations.

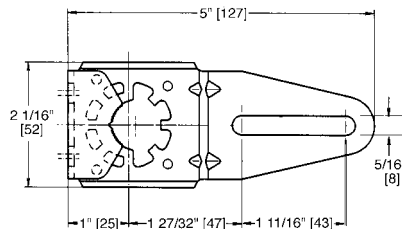
IND-LF

IND-LF Damper Position Indicator
For LF Series Actuators. Similar to IND-AF2

Linkage accessories

When the actuator is not mounted to the damper shaft

KH-AF / KH-AF-1

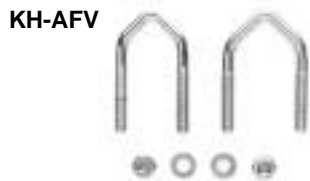


KH-AF Crankarm
For AF and NF Series Actuators

Fits round shafts to 3/4". Retaining clip fixes clamp to actuator teeth.

KH-AF-1 Crankarm for Jackshaft Applications
For AF and NF Series Actuators

Fits round shafts to 1.05". Retaining clip fixes clamp to actuator teeth.



KH-AFV

KH-AFV V-Bolt Kit
For AF/NF Crankarms

Allows direct coupling with KH-AF, KH-AF-1. Contains 3/4" V-bolt, 1" V-bolt. 2 Nuts and Washers.



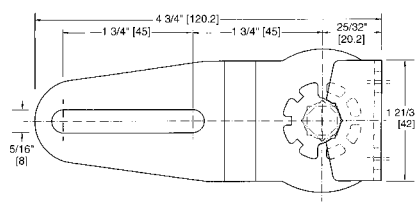
KH-LFV

KH-LFV V-Bolt Kit
For LF Crankarms

Allows direct coupling with KH-LF. Contains V-bolt and 2 nuts.



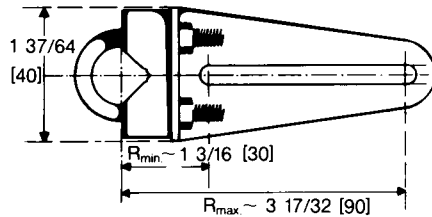
KH-LF



KH-LF Crankarm
For LF Series Actuators

Fits shafts to 1/2". Retaining clip fixes clamp to actuator teeth.

KH6/ KH8



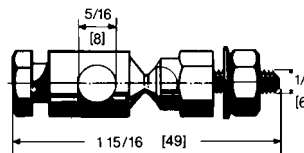
KH6 Universal Crankarm

Zinc plated steel, for damper shafts 3/8" to 11/16" dia. (10 to 18mm) or 3/8" to 9/16" square (10 to 14mm). Slot width 1/4" (6.2mm). Uses KG6 or KG10 ball joint.

KH8 Universal Crankarm

Zinc plated steel, suitable for damper shafts 3/8" to 11/16" dia. (10 to 18mm) or 3/8" to 9/16" square (10 to 14mm). Slot width 21/64" (8.2mm). Uses KG8 or KG10 ball joint.

KG6



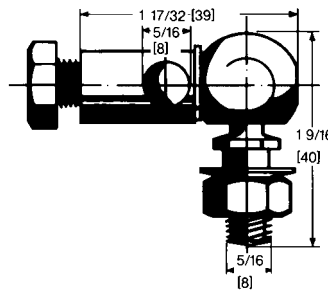
KG6 Ball Joint

For KH6 Universal Crankarm

Zinc plated steel. For 5/16" dia. rod (8mm).

The KG6 ball joint is only recommended up to 70 in-lbs.

KG8

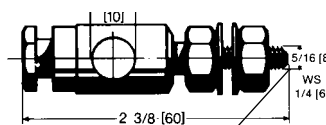


KG8 90° Ball Joint

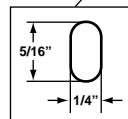
For KH8 Universal Crankarms

Zinc plated steel. For 5/16" dia. rod (8mm). 90° angle.

KG10



The bolt portion of the KG10 fits both a 5/16" slot and 1/4" slot.

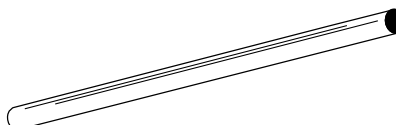


KG10 Ball Joint

Used with the following Crankarms:

KH6 = 1/4"
KH8 = 5/16"

SH8



SH8 Push Rod

For KG6 and KG8 Ball Joints

36" length. 5/16" dia.

SH10

SH10 Push Rod

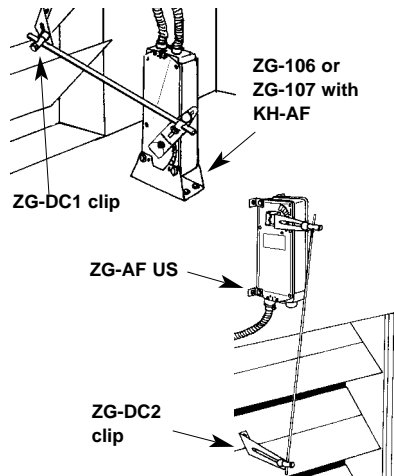
For KG10 Ball joints

36" length. 3/8" dia.

ZG-DC1



ZG-DC2



ZG-DC1 Damper Clip
Mounts to damper blade - 3.5"

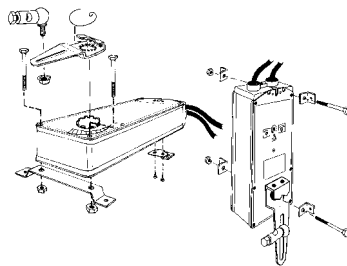
ZG-DC2 Damper Clip
Mounts to damper blade - 6"

The ZG-DC1 and ZG-DC2 damper clips are designed to mount to damper blades and work as crankarms in damper linkage applications. The ZG-DC1 is designed to be used in applications where the actuator is located in front of the damper. The ZG-DC2 is designed to be used when the actuator is located above or below the damper.

Crankarm adaptor kits

When the actuator is not mounted to the damper shaft

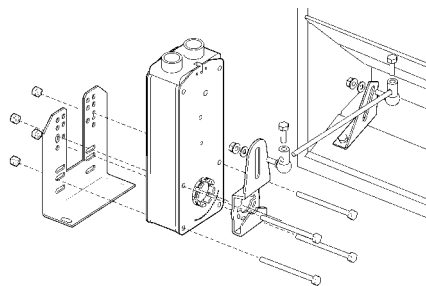
ZG-AF US



ZG-AF Crankarm Adaptor Kit
For AF and NF Series Actuators

Kit contains: 1 KH-AF crankarm with retaining ring
2 stand-off brackets
4 mounting feet
2 bolts with nuts
2 self-tapping metal screws
2 KG8 ball joints
Instructions

ZG-AF108

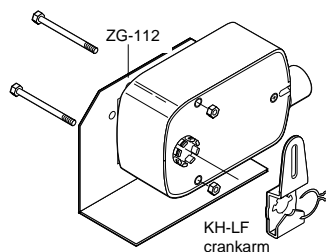


ZG-AF108 Crankarm Adaptor Kit
For AF and NF Series Actuators

Kit contains: 1 KH-AF crankarm with retaining ring
1 ZG-108 mounting bracket (see page 10)
4 bolts with nuts

Note: May require crankarm and balljoints.

ZG-LF112

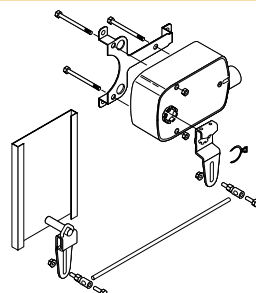


ZG-LF112 Crankarm Adaptor Kit
For LF Series Actuators

Kit contains: 1 KH-LF crankarm with retaining ring
1 ZG-112 mounting bracket (see page 63)
2 bolts with nuts

Note: May require crankarm and balljoints.

ZG-LF2

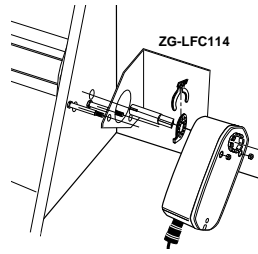


ZG-LF2 Crankarm Adaptor Kit
For LF Series Actuators

Kit contains: 1 KH-LF crankarm with retaining clip
1 mounting bracket
3 bolts with nuts
Instructions

Note: May require crankarm and balljoints.

ZG-LFC114

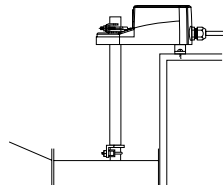


ZG-LFC114 Mounting Kit

Specifically for Trane Voyager unit retrofit

- Kit contains:
- 1-Mounting bracket
 - 1-Shaft adaptor
 - 2-Actuator mounting bolts and nuts
 - 4-Mounting bracket screws

AV10-18

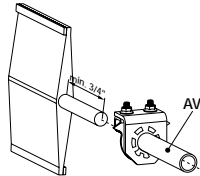


AV10-18 Universal Shaft Extension

For damper operating shafts

Approx. 9 1/2" (240mm) extension for shafts 3/8" to 11/16" dia. (10 to 18mm), or 3/8" to 9/16" square (10 to 14mm).

AV1



AV1 Shaft Extension for AM Series Actuators

Approx. 3" (75mm) extension for shafts 3/8" to 3/4" dia. (10 to 20mm), or 3/8" to 9/16" square (10 to 14mm).

ZG-NMSA-1



ZG-NMSA-1 Shaft Adaptor

For NM Series Actuators

For 1/2" dia. shafts shorter than 3/4". 3" long, 13/16" outside dia. 2 set screws. Shaft extends 1" inside ZG-NMSA-1.

ZG-LMSA



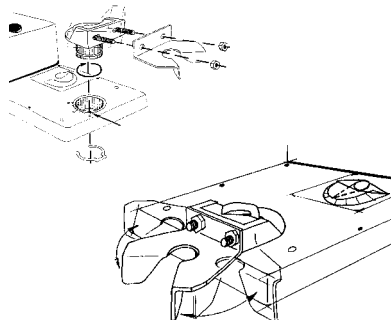
ZG-LMSA Shaft Adaptor

For LM, LF Series Actuators

For 1/2" dia. shafts shorter than 3/4". 3" long, 5/8" outside dia. 2 set screws. Shaft extends 3/4" inside ZG-LMSA.

Rotation limiters

ZDB

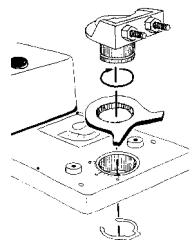


ZDB Angle of Rotation Limiter

For SM Series Actuators

Remove nuts on V-bolt and install ZDB to clamp assembly with indicator in 0 position. Remove clip holding clamp assembly to actuator. Pull out clamp assembly and rotate to the number of graduations you would like to limit rotation by. Each graduation is 9°. Reinstall clamp assembly.

ZDB-GM

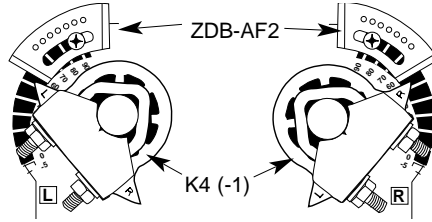


ZDB-GM Angle of Rotation Limiter

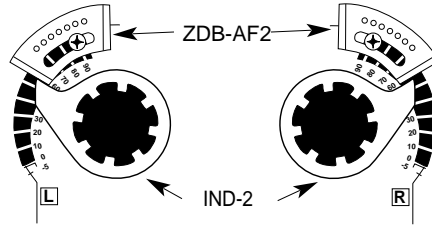
For GM Series Actuators

Disengage gears with manual release and turn clamp indicator to 0 position. Pull out retaining clip and remove clamp. Locate ZDB-GM at desired graduation (each approx. 10°). Reinstall clamp.

ZDB-AF2



Rotation Limiting with ZDB-AF2 in standard shaft mounting.



Rotation Limiting with ZDB-AF2 in short shaft mounting requires IND-AF2 Position Indicator. Actuator's standard clamp faces damper.

ZDB-AF2 Angle of Rotation Limiter For AF and NF Series Actuators

The ZDB-AF2 is used in conjunction with the tab on the universal clamp or IND-AF2 position indicator which comes with the ZDB-AF2. In order to function properly, the clamp or indicator must be mounted correctly. The ZDB-AF2 may not work in certain mounting orientations using the ZG-106 or ZG-107 mounting brackets. It will not work with the ZG-108 mounting bracket. Limiting the damper rotation must be accomplished by adjusting the crankarm linkage.

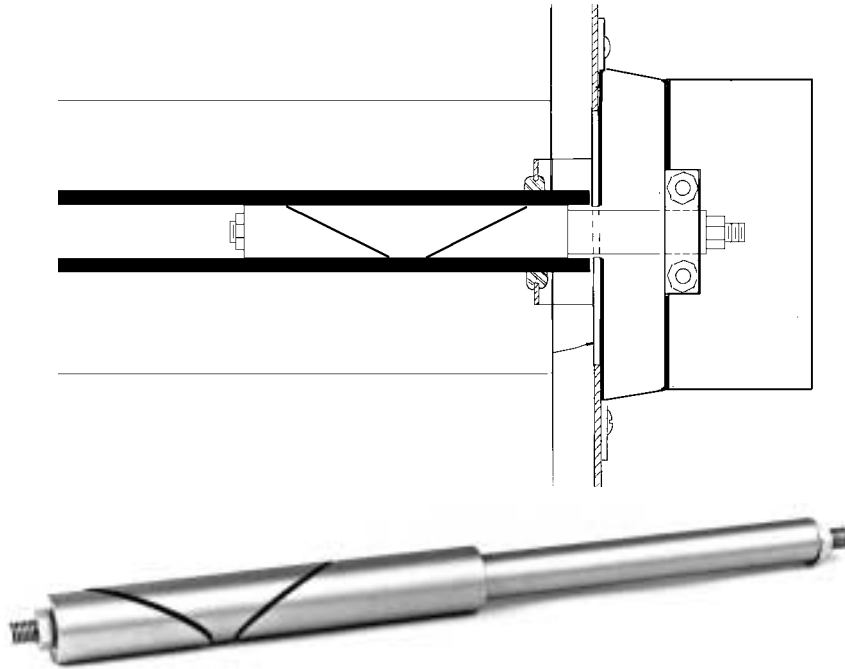
1. Determine damper rotation required.
2. Locate the ZDB-AF2 on the actuator so that its edge lines up with the degree graduation on the actuator face which corresponds with the required rotation.
3. Make sure the locating "teeth" on the ZDB-AF2 are engaged into the locating holes on the actuator.
4. Pierce the actuator label at the cross hair showing through the slot on the ZDB-AF2. Fasten to the actuator using the self tapping screw provided.

Miscellaneous

ZG-H2



ZG-H2 Actuator Operator Handle For SM, AM (with 3/4" clamp), GM and NM Series Actuators



Application

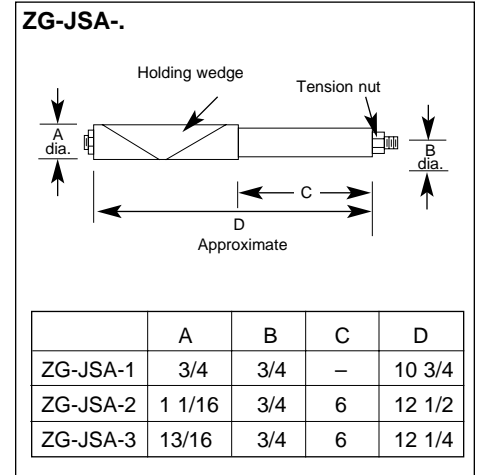
The ZG-JSA jack shaft adaptors are designed to be inserted into hollow jack shafts which have an outside diameter greater than 3/4 inch and provide a 3/4 inch shaft for mounting Belimo actuators.

Installation

1. Check the inside edge of the jack shaft for burrs. Use a file if necessary to remove any burr which would prevent the ZG-JSA from being inserted into the jack shaft.
2. The inside surface of the jack shaft should be clean. If necessary, clean the jack shaft to remove any oil, grease, or dirt.
3. Loosen the tension nut on the ZG-JSA enough to allow the diameter of the holding wedge to be in line with the two other sections of the adaptor.
4. Insert the ZG-JSA into the jack shaft. Care must be taken to make sure that the wedge section of the adaptor is a minimum of 1 1/2 inches from any jack shaft holding bushing. If the holding wedge section is too close to a bushing, the adaptor may lock the jack shaft to the bushing or the bushing may be damaged.
5. Tighten the tension nut on the ZG-JSA to expand the holding wedge section, fixing the adaptor to the jack shaft.
6. Mount the specified actuator to the 3/4 inch section of the adaptor.

Technical Data	ZG-JSA-1	ZG-JSA-2	ZG-JSA-3
Jack shaft size			
Outside dia.	1.00 "	1 5/16"	1.05"
Inside dia.	3/4 "	1 3/32"	27/32"
Weight	1.3 lbs.	2.3 lbs.	1.6 lbs.
Material	Cold rolled steel, nickel plated		

Dimensions



ZG-100 Universal Mounting Bracket

For SM, AM, GM, NF, and AF series actuators



Application

The ZG-100 universal mounting bracket is designed for applications where the actuator cannot be mounted directly to the damper shaft, and no proper mounting surface is available. It may be used for outside or inside the duct mounting, fastened to the ductwork or directly to the damper assembly. It may also be used to mount to other surfaces rather than the duct.

The ZG-100 is provided with prepunched hole patterns for the SM, GM, NF and AF series actuators and their associated crankarm adaptor brackets. The hole pattern layout allows mounting these actuators in three, different, mounting orientations. The ZG-100 may also be field drilled for special or more exact mounting of linkage components.

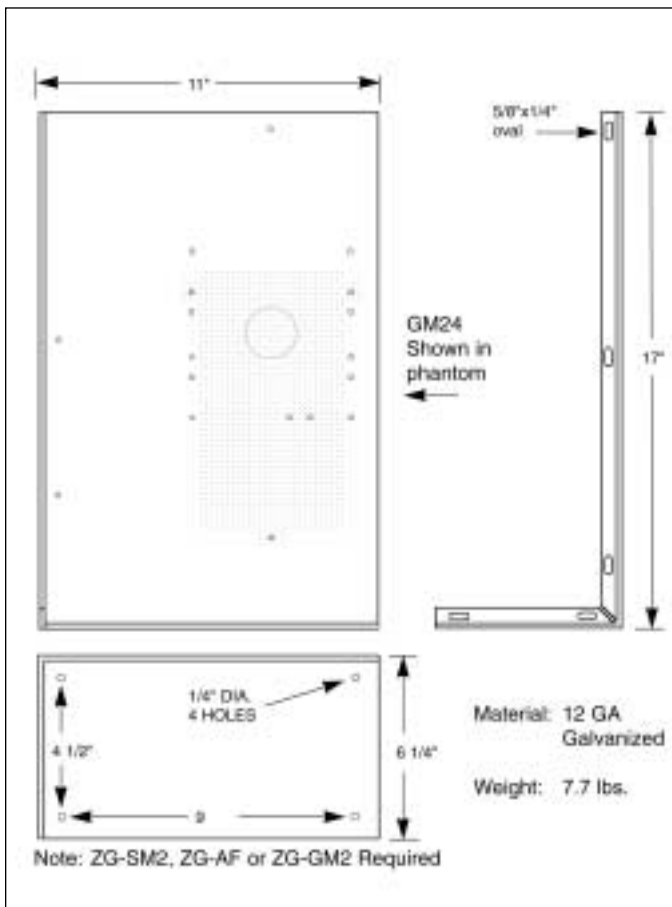
Installation

1. Mount the appropriate set of crankarm adaptor kit brackets and crankarm to the actuator to be used. When using spring return actuators, care must be taken to select the proper mounting orientation for the correct fail-safe operation.

ACTUATOR SERIES	CRANKARM KIT FOR ZG-100
SM	ZG-SM2
AM	ZG-AM
GM	ZG-GM2
NF	ZG-AF
AF	ZG-AF

Note: Follow the instructions for mounting the adaptor kits to the actuator or the actuator may be damaged.

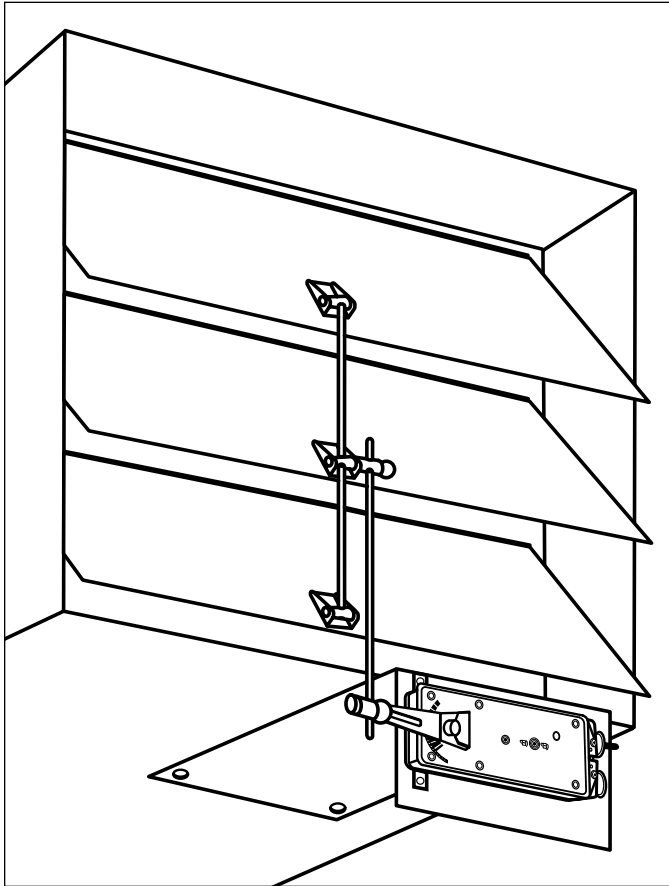
2. Position the ZG-100 mounting bracket in the planned mounting location. If possible, do not fasten at this time. The ZG-100 can be mounted by using either the four 1/4 inch diameter holes on its base or five 1/4 x 5/8 inch oval holes on its edge. Additional holes may be drilled if necessary.
3. Position the actuator/adaptor assembly in the desired mounting location against the ZG-100 and see if one of the existing hole patterns can be used for the actuator mounting. If the existing hole patterns cannot be used, mark the correct hole positions and drill the desired holes. Do not mount.
4. With the actuator mounting position established, position the ZG-100 bracket in the best position for proper crankarm/linkage alignment. Fasten the ZG-100 to the mounting surface.
5. Mount the actuator/adaptor assembly to the ZG-100.
6. Install the crankarm linkage between the actuator and damper.
7. Cycle the actuator through its operational range to verify correct linkage setup. The SM, GM, and AF actuator series may be manually operated without power available.



OTHER UNIVERSAL MOUNTING BRACKETS

MODEL	ACTUATOR USED WITH
ZG-101	SM, AM, GM, NF, AF
ZG-103	SM, AM, GM
ZG-104	SM, AM, GM
ZG-105	NM
ZG-106	NF, AF
ZG-107	NF, AF
ZG-108	NF, AF

F20358 / 5 4 3 2 1 -01/04-10M-IG-Subject to change. © Bellimo Aircontrols (USA), Inc.



Application

The ZG-101 universal mounting bracket is designed for applications where the actuator cannot be mounted directly to the damper shaft, and no proper mounting surface is available. It may be used for outside or inside the duct mounting. The bracket is designed to mount to the damper base, providing greater strength than mounting to the sheet metal or fiber-board duct only. It may also be used as a standard right angle mounting bracket where more contact area is desired. The larger contact area spreads the torsional load created by the actuator/damper operation over a wider area.

The ZG-101 is provided with prepunched hole patterns for the SM, GM, NF and AF series actuators and their associated crankarm adaptor brackets. The hole pattern layout allows mounting these actuators in two, different, mounting orientations.

Installation

1. Mount the appropriate set of crankarm adaptor kit brackets and crankarm to the actuator to be used. When using spring return actuators, care must be taken to select the proper mounting orientation for the correct fail-safe operation.

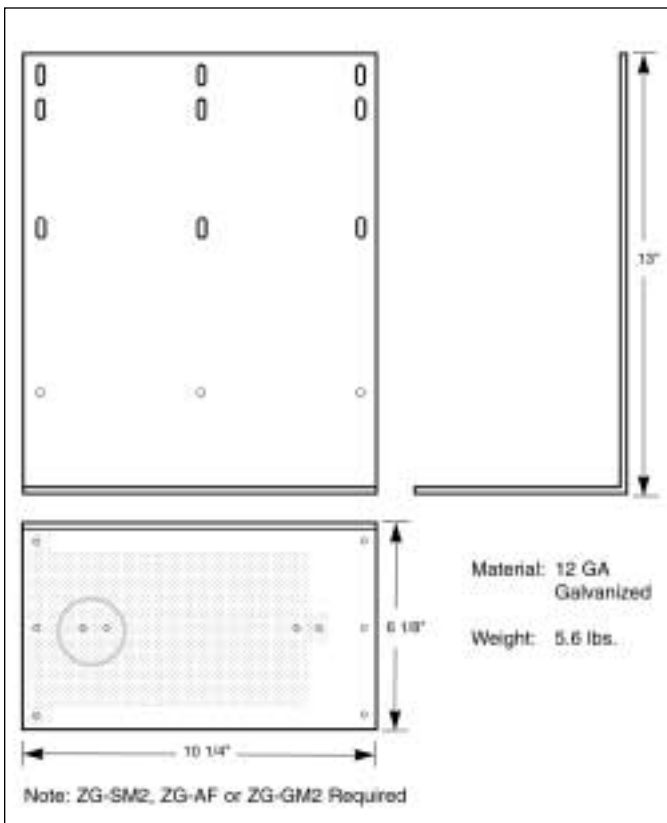
ACTUATOR SERIES	CRANKARM KIT FOR ZG-101
SM	ZG-SM2
AM	ZG-AM
GM	ZG-GM2
NF	ZG-AF
AF	ZG-AF

Note: Follow the instructions for mounting the adaptor kits to the actuator or the actuator may be damaged.

2. Position the ZG-101 mounting bracket in the planned mounting location. If possible, do not fasten at this time. The ZG-101 can be mounted by using at least three of the nine 1/4 x 5/8 inch oval holes. Additional holes may be drilled if necessary.
3. Position the actuator/adaptor assembly in the desired mounting location against the ZG-101 and see if one of the existing hole patterns can be used for the actuator mounting. If the existing hole patterns cannot be used, mark the correct hole positions and drill the desired holes. Do not mount.
4. With the actuator mounting position established, position the ZG-101 bracket in the best position for proper crankarm/linkage alignment. Fasten the ZG-101 to the mounting surface.
5. Mount the actuator/adaptor assembly to the ZG-101.
6. Install the crankarm linkage between the actuator and damper.
7. Cycle the actuator through its operational range to verify correct linkage setup. The SM, GM, and AF actuator series may be manually operated without power available.

OTHER UNIVERSAL MOUNTING BRACKETS

MODEL	ACTUATOR USED WITH
ZG-100	SM, AM, GM, NF, AF
ZG-103	SM, AM, GM
ZG-104	SM, AM, GM
ZG-105	NM
ZG-106	NF, AF
ZG-107	NF, AF
ZG-108	NF, AF



ZG-102 Multiple Actuator Mounting Bracket

For GM and AF series actuators



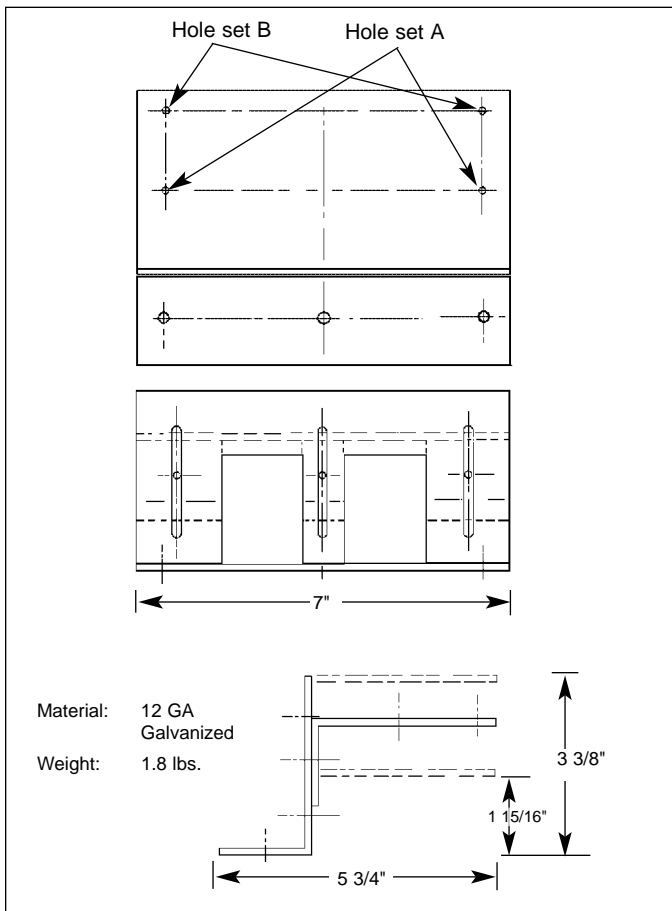
Application

The multiple actuator mounting bracket is designed for cases where it is necessary to mount two actuators to one shaft to provide extra torque.

The dual mounting bracket is typically used with the AF and GM series actuators. This is due to the fact that each of these series are the highest torque range available.

Installation

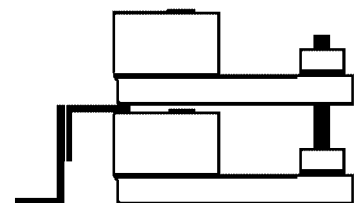
1. Determine if the second actuator will mount on top of (Figure A) or 180° opposed to (Figure B) the first actuator.
2. Mount the first actuator as you would normally; but, do not wire at this time. Make sure the shaft clamp assembly on the actuator is positioned correctly for proper damper operation.
3. Mount the actuator rear mounting bracket to the top of the multiple actuator mounting bracket. There are two locations for the mounting of this bracket. Hole set A is the preferred location. Hole set B is to be used if additional clearances are required to route flexible conduit to the actuators.
4. Loosen the three locking screws located in the slots of the mounting bracket.
5. Adjust the top section of the bracket to a height which clears the top of the first actuator by approximately 1/8". Tighten the three locking screws.
6. Mount the second actuator on the shaft and slide the mounting bracket under the second actuator so the rear mounting bracket stud engages the slot at the rear of the actuator.
7. Transfer the thru hole locations from the multiple actuator mounting bracket base to the mounting surface.
8. Drill the three holes. (Use a No. 2 drill if you are using the No. 8 sheet metal screws provided.)
9. Fasten the multiple mounting bracket.
10. After verifying the correct orientation of the shaft clamp assembly of the second actuator, tighten the fastening nuts on the clamp.
11. Wire the actuators in parallel to the controller.
12. Power the actuators and check for proper operation.



Accessory

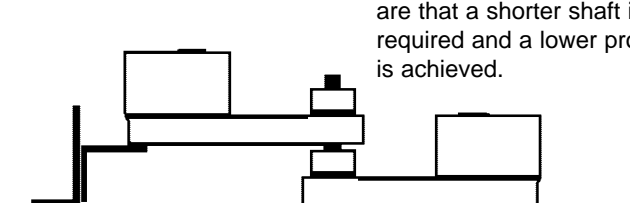
AV10 - 18 Universal shaft extension

Figure A

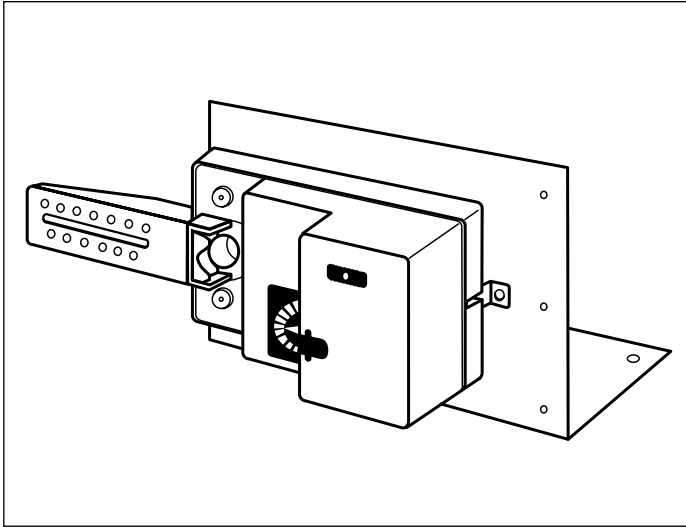


Note: The major advantage with this method is it requires less mounting area. The manual override, if available, cannot be used in this configuration.

Figure B



Note: The major advantages are that a shorter shaft is required and a lower profile is achieved.



Application

The ZG-103 universal mounting bracket is designed for applications where the actuator cannot be mounted directly to the damper shaft, and no proper mounting surface is available. It may be used for outside or inside the duct mounting. The ZG-103 is designed to mount the SM and GM series actuators in the same mounting locations as common foot mounted, crankarm style actuators.

The ZG-103 is provided with prepunched hole patterns for the SM, and GM series actuators and their associated crank-arm adaptor brackets. The hole pattern layout allows mounting these actuators in two, different, mounting orientations.

Installation

1. Mount the appropriate set of crankarm adaptor kit brackets and crankarm to the actuator to be used. When using spring return actuators, care must be taken to select the proper mounting orientation for the correct fail-safe operation.

ACTUATOR SERIES	CRANKARM KIT FOR ZG-103
SM	ZG-SM2
AM	ZG-AM
GM	ZG-GM2

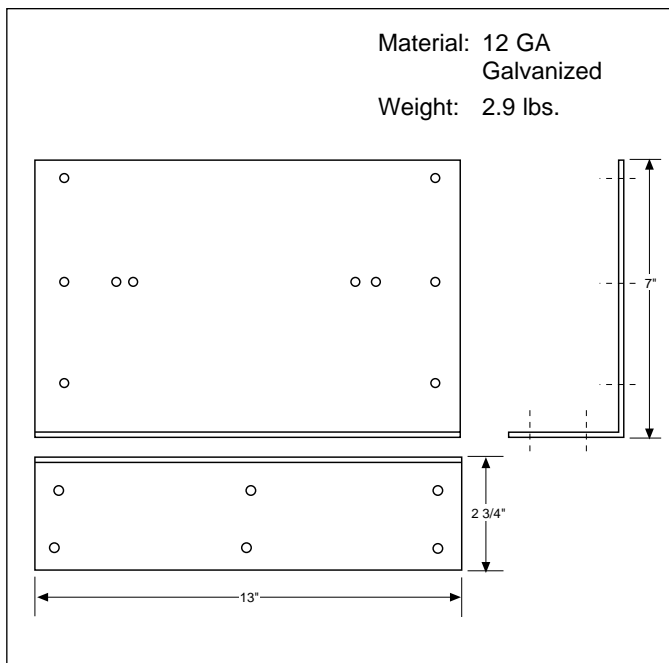
Note: Follow the instructions for mounting the adaptor kits to the actuator or the actuator may be damaged.

2. Position the ZG-103 mounting bracket in the planned mounting location. If possible, do not fasten at this time. The ZG-103 can be mounted by using at least two of the six 1/4 inch diameter holes in its base. Additional holes may be drilled if necessary.
3. Position the actuator/adaptor assembly in the desired mounting location against the ZG-103 and locate the existing hole pattern for the actuator mounting. If the existing hole patterns cannot be used, mark the correct hole positions and drill the desired holes. Do not mount.
4. With the actuator mounting position established, position the ZG-103 bracket in the best position for proper crankarm/linkage alignment. Fasten the the ZG-103 to the mounting surface.
5. Mount the actuator/adaptor assembly to the ZG-103.
6. Install the crankarm linkage between the actuator and damper.
7. Cycle the actuator through its operational range to verify correct linkage setup. The SM, and GM actuator series may be manually operated without power available.

OTHER UNIVERSAL MOUNTING BRACKETS

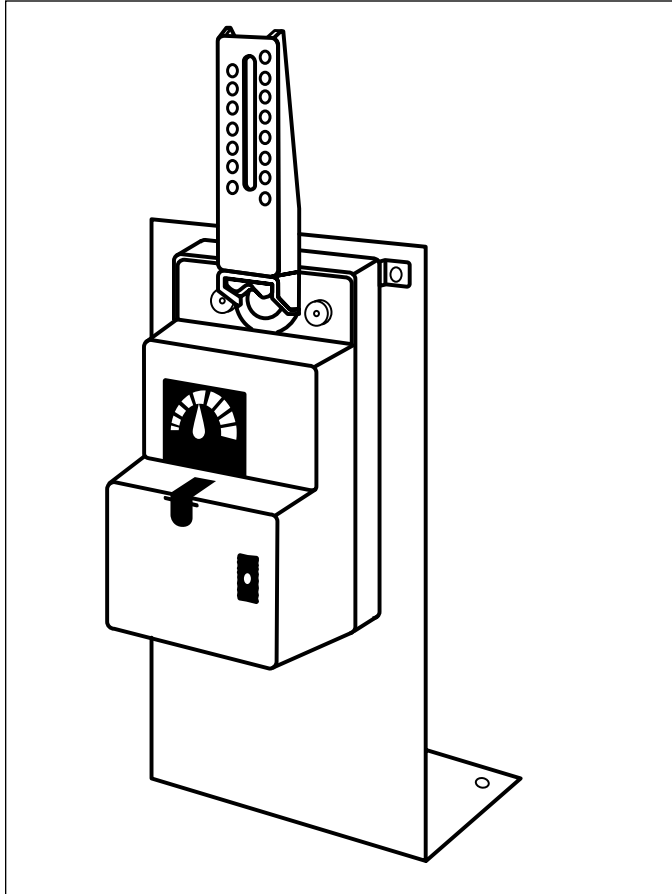
MODEL	ACTUATOR USED WITH
ZG-100	SM, AM, GM, NF, AF
ZG-101	SM, AM, GM, NF, AF
ZG-104	SM, AM, GM
ZG-105	NM
ZG-106	NF, AF
ZG-107	NF, AF
ZG-108	NF, AF

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ZG-104 Universal Mounting Bracket

For SM, AM and GM series actuators



Application

The ZG-104 universal mounting bracket is designed for applications where the actuator cannot be mounted directly to the damper shaft, and no proper mounting surface is available. It may be used for outside or inside the duct mounting. The ZG-104 is designed to mount the SM, and GM series actuators in the same mounting locations as common foot mounted, crankarm style actuators.

The ZG-104 is provided with prepunched hole patterns for the SM and GM series actuators and their associated crankarm adaptor brackets. The hole pattern layout allows mounting these actuators in 2, different, mounting orientations.

Installation

1. Mount the appropriate set of crankarm adaptor kit brackets and crankarm to the actuator to be used. When using spring return actuators, care must be taken to select the proper mounting orientation for the correct fail-safe operation.

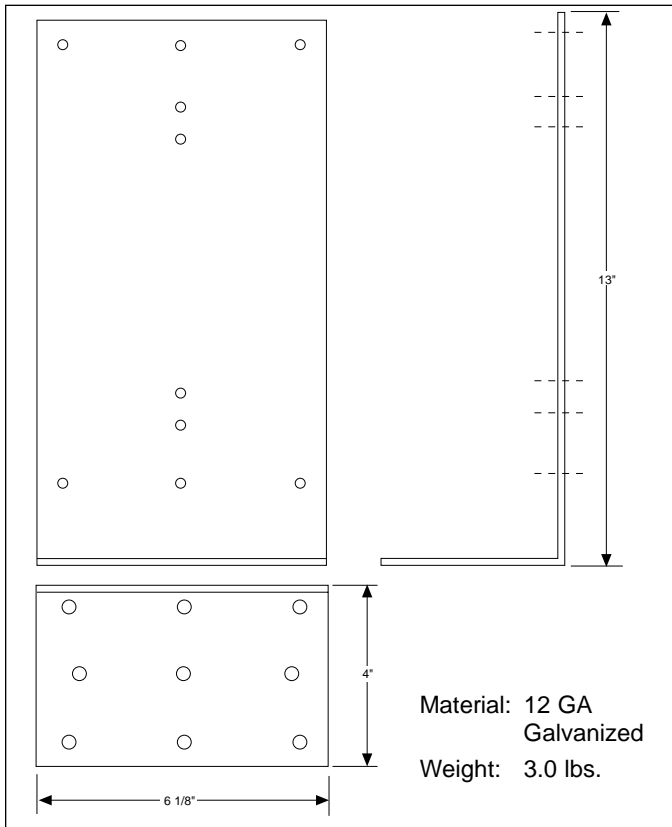
ACTUATOR SERIES	CRANKARM KIT FOR ZG-104
SM	ZG-SM2
AM	ZG-AM
GM	ZG-GM2

Note: Follow the instructions for mounting the adaptor kits to the actuator or the actuator may be damaged.

2. Position the ZG-104 mounting bracket in the planned mounting location. If possible, do not fasten at this time. The ZG-104 can be mounted by using at least three of the nine 1/4 inch diameter holes in its base. Additional holes may be drilled if necessary.
3. Position the actuator/adaptor assembly in the desired mounting location against the ZG-104 and locate the existing hole pattern for the actuator mounting. If the existing hole patterns cannot be used, mark the correct hole positions and drill the desired holes. Do not mount.
4. With the actuator mounting position established, position the ZG-104 bracket in the best position for proper crankarm/linkage alignment. Fasten the ZG-104 to the mounting surface.
5. Mount the actuator/adaptor assembly to the ZG-104.
6. Install the crankarm linkage between the actuator and damper.
7. Cycle the actuator through its operational range to verify correct linkage setup. The SM, and GM actuator series may be manually operated without power available.

OTHER UNIVERSAL MOUNTING BRACKETS

MODEL	ACTUATOR USED WITH
ZG-100	SM, AM, GM, NF, AF
ZG-101	SM, AM, GM, NF, AF
ZG-103	SM, AM, GM
ZG-105	NM
ZG-106	NF, AF
ZG-107	NF, AF
ZG-108	NF, AF



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Application

The ZG-105 universal mounting bracket is designed for applications where the actuator cannot be mounted directly to the damper shaft, and no proper mounting surface is available. It may be used for outside or inside the duct mounting. The ZG-105 is designed to mount the NM series actuators in the same mounting locations as common foot mounted, crankarm style actuators.

The ZG-105 is provided with prepunched hole patterns for use with the NM series actuators with the ZG-NM3 crankarm adaptor kit. The hole pattern layout allows mounting these actuators in two, different, mounting orientations.

Installation

1. Position the ZG-105 mounting bracket in the planned mounting location. If possible, do not fasten at this time. The ZG-105 can be mounted by using the three 9/64 inch diameter holes in its base. Additional holes may be drilled if necessary.
2. Using a number 10 tamper-proof torx screwdriver, remove the four torx head screws on the base of the actuator.
3. Position the actuator in the desired mounting location against the ZG-105 and locate the existing hole pattern for the actuator mounting.
4. Align the screw holes in the base of the actuator to the selected hole set in the ZG-105 and fasten the actuator to the bracket using the four screws removed in step 2.
5. Mount the NM crankarm into the universal mounting clamp at the desired starting angle. Fasten the ZG-105 to the mounting surface.
6. Install the crankarm linkage between the actuator and damper.
7. Cycle the actuator through its operational range to verify correct linkage setup. The NM actuator series may be manually operated without power available.

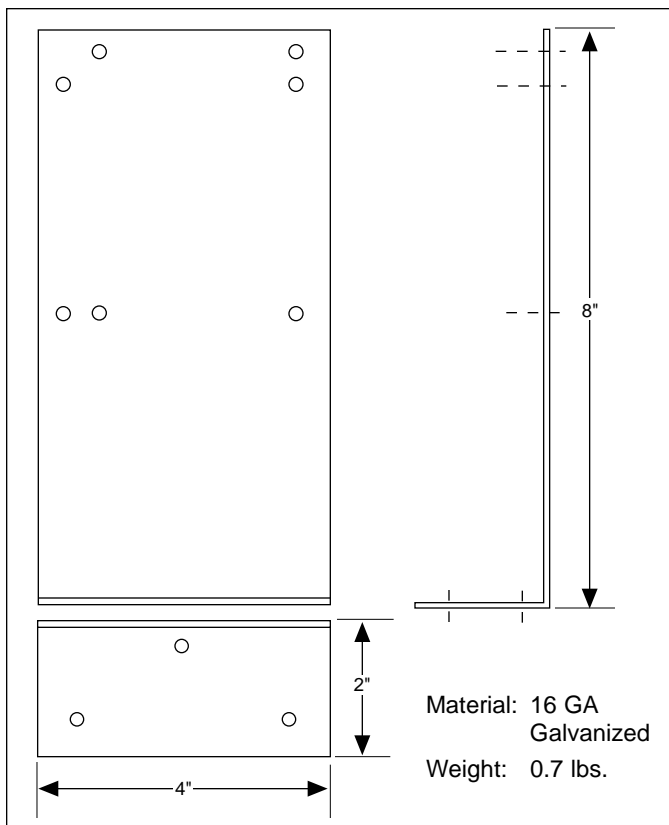
OTHER UNIVERSAL MOUNTING BRACKETS

MODEL	ACTUATOR USED WITH
ZG-100	SM, GM, NF, AF
ZG-101	SM, GM, NF, AF
ZG-103	SM, GM
ZG-104	SM, GM
ZG-106	NF, AF
ZG-107	NF, AF
ZG-108	NF, AF

Accessory

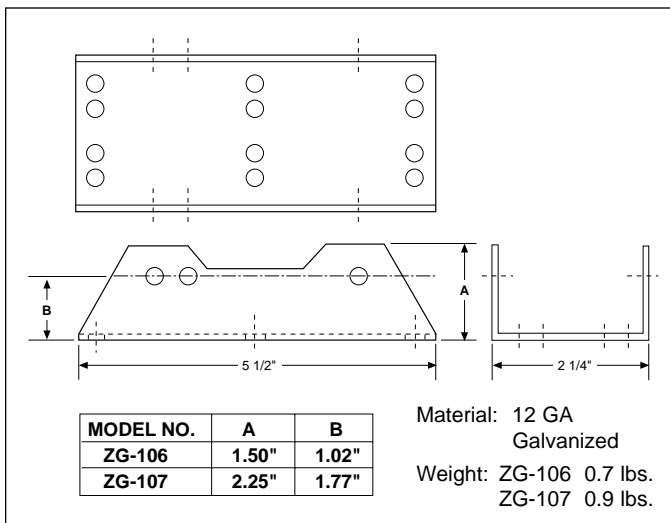
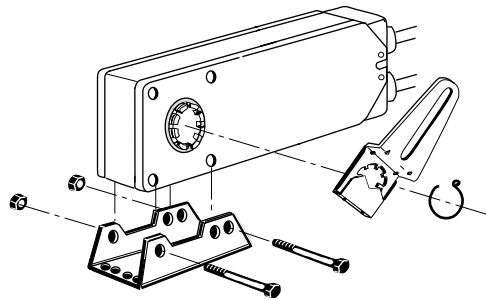
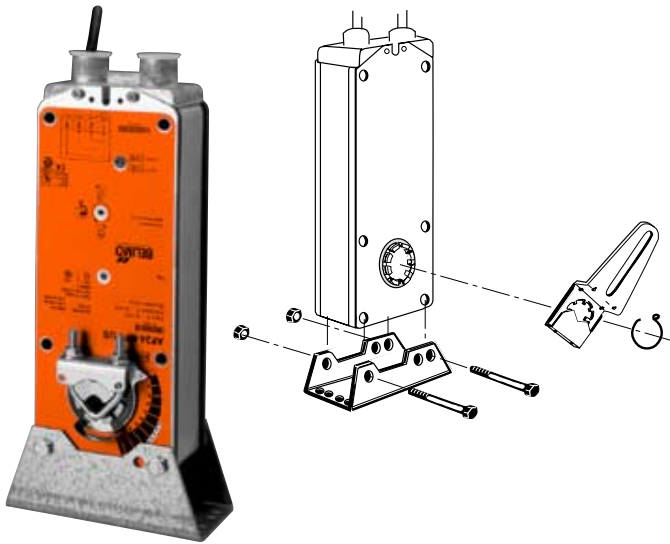
TOOL-03 #10, Tamper-proof TORX screwdriver

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ZG-106 / ZG-107 Universal Mounting Bracket

For AF and NF series actuators



Application

The ZG-106 and ZG-107 universal mounting brackets are designed for applications where the actuator cannot be mounted directly to the damper shaft. They may be used for outside or inside the duct mounting. The ZG-106 and ZG-107 are designed to mount the NF and AF series actuators in the same mounting locations as common foot mounted, crankarm style actuators. Hole patterns in the base match common Honeywell™ and Johnson Controls™ actuators for easy retrofit. The ZG-106 and ZG-107 are designed with different actuator mounting heights. The ZG-106 is designed to place the KH-AF crankarm in the same relative position as the Honeywell™ Mod IV actuators. The ZG-107 will place the crankarm in the same relative position as the Honeywell™ Mod III actuators.

The ZG-106 and ZG-107 are provided with hole patterns to mount the NF and AF series actuators in either a horizontal or vertical position to meet space requirements. The KH-AF crankarm is required to fully convert the NF or AF for crankarm operation.

Installation

1. When using spring return actuators, care must be taken to select the proper mounting orientation for the correct fail-safe operation.

2. If this is a new installation, position the ZG-106 or ZG-107 mounting bracket in the planned mounting location. Do not fasten at this time.

If this a retrofit installation replacing common Honeywell™ or Johnson Control™ actuators, and the bolt pattern of the bracket matches the pattern of the previous actuator, fasten the bracket to the mounting surface. Mount the KH-AF crankarm to the actuator. Proceed to step 6.

3. Position the actuator in the desired mounting position (horizontal or vertical) in the ZG-106 or ZG-107. Slide in the mounting bolts to temporarily hold the actuator to the bracket.

4. Mount the KH-AF crankarm to the actuator in the required operating position.

5. Position the bracket/actuator assembly in the best position for proper crankarm/linkage alignment. Mark the bracket position. Remove the actuator. Fasten the bracket to the mounting surface.

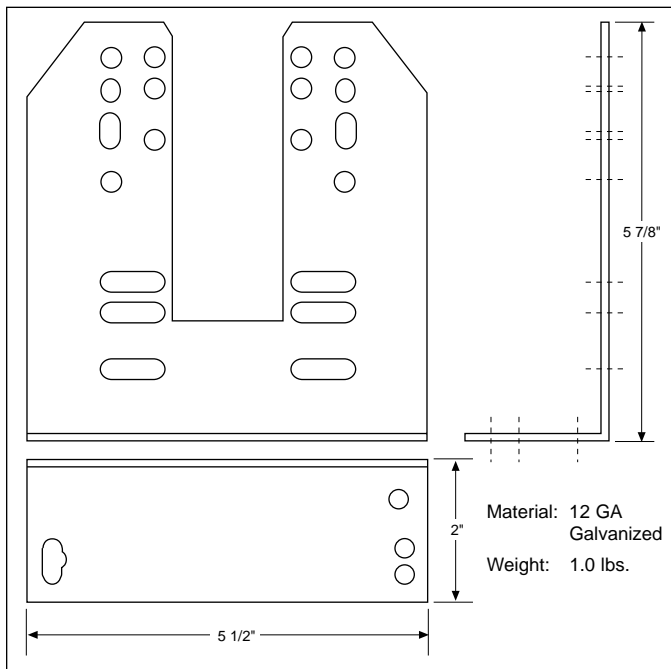
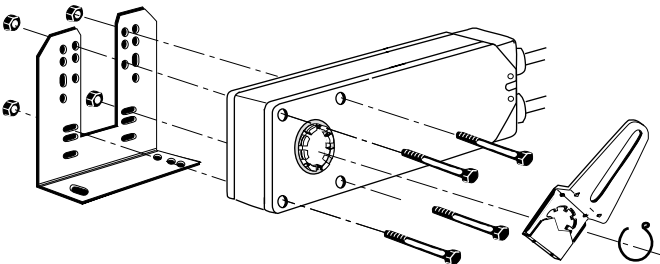
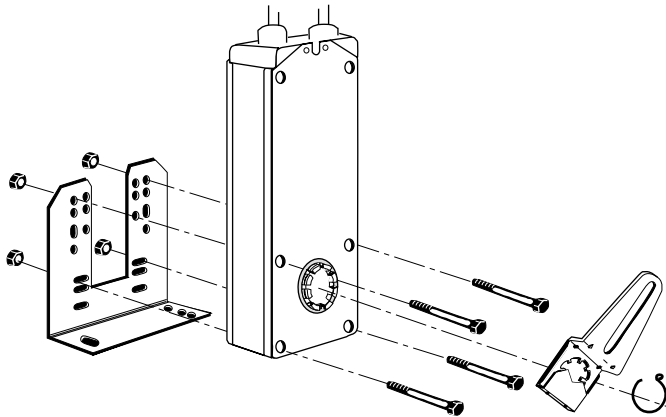
6. Mount the actuator to the bracket using the 2 mounting bolts and lock nuts.

7. Install the linkage assembly between the damper and actuator.

8. Cycle the actuator through its operational range to verify correct linkage setup. The AF actuator series may be manually operated without power available.

OTHER UNIVERSAL MOUNTING BRACKETS

MODEL	ACTUATOR USED WITH
ZG-100	SM, GM, NF, AF
ZG-101	SM, GM, NF, AF
ZG-103	SM, GM
ZG-104	SM, GM
ZG-105	NM
ZG-108	NF, AF



Application

The ZG-108 universal mounting bracket is designed for applications where the actuator cannot be mounted directly to the damper shaft. It may be used for outside or inside the duct mounting. The ZG-108 is designed to mount the NF and AF series actuators in the same mounting locations as common foot mounted, crankarm style actuators. Hole patterns in the base match common Honeywell™, Siebe™ (Barber Colman™) and Johnson Controls™ actuators for easy retrofit.

The ZG-108 is provided with hole patterns to mount the NF and AF series actuators in either a horizontal or vertical position to meet space requirements. The KH-AF crankarm is required to fully convert the NF or AF for crankarm operation.

Installation

1. When using spring return actuators, care must be taken to select the proper mounting orientation for the correct fail-safe operation.

2. If this is a new installation, position the ZG-108 mounting bracket in the planned mounting location. Do not fasten at this time.

If this is a retrofit installation replacing common Honeywell™, Siebe™ (Barber Colman™) or Johnson Control™ actuators, and the bolt pattern of the bracket matches the pattern of the previous actuator, fasten the bracket to the mounting surface. Mount the KH-AF crankarm to the actuator. Proceed to step 6.

3. Position the actuator in the desired mounting position (horizontal or vertical) on the ZG-108. Slide in two of the mounting bolts and loosely tighten the lock nuts to temporarily hold the actuator to the bracket.

Note: The ZG-108 has hole patterns for three mounting heights for the crankarm location, choose the best height for the application.

4. Mount the KH-AF crankarm to the actuator in the required operating position.

5. Position the bracket/actuator assembly in the best position for proper crankarm/linkage alignment. Mark the bracket position. Remove the actuator. Fasten the bracket to the mounting surface.

6. Mount the actuator to the bracket using the four mounting bolts and lock nuts at the same height location as determined in step 3. Or, if a retrofit application, select the correct hole set so the crankarm location matches the crankarm of the actuator being replaced.

7. Install the linkage assembly between the damper and actuator.

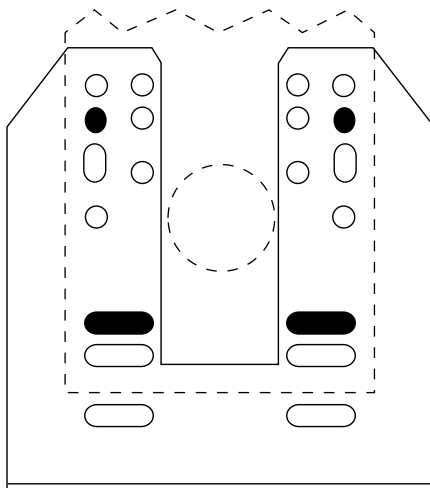
8. Cycle the actuator through its operational range to verify correct linkage setup. The AF actuator series may be manually operated without power available.

OTHER UNIVERSAL MOUNTING BRACKETS

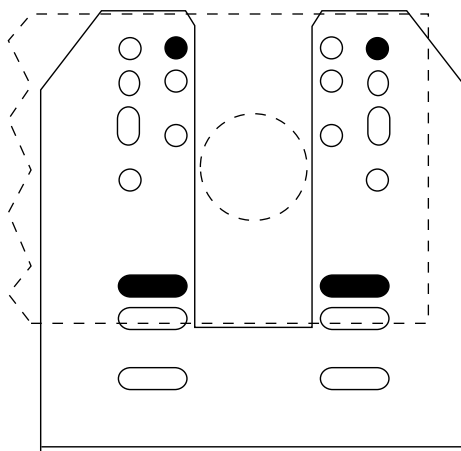
MODEL	ACTUATOR USED WITH
ZG-100	SM, GM, NF, AF
ZG-101	SM, GM, NF, AF
ZG-103	SM, GM
ZG-104	SM, GM
ZG-105	NM
ZG-106	NF, AF
ZG-107	NF, AF

ZG-108 Universal Mounting Bracket

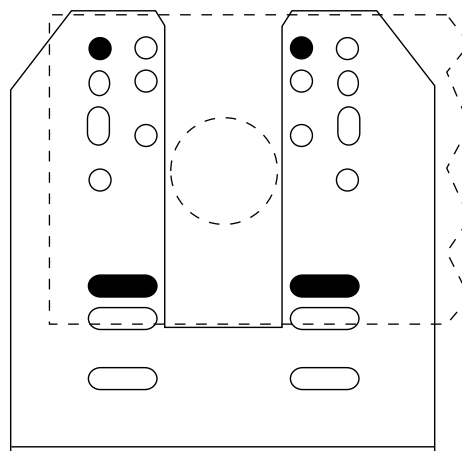
Mounting Positions for Typical Replacements



Barber Colman™ MA Type - Vertical

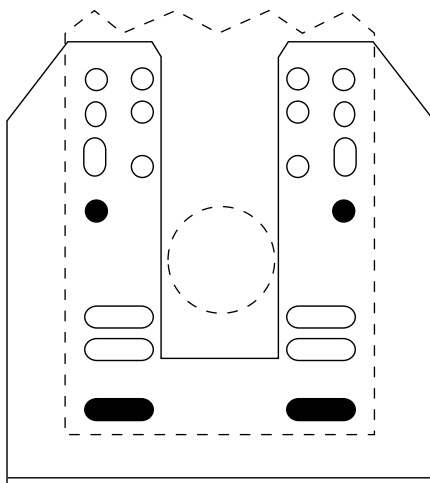


Barber Colman™ MA Type - Horizontal (left)

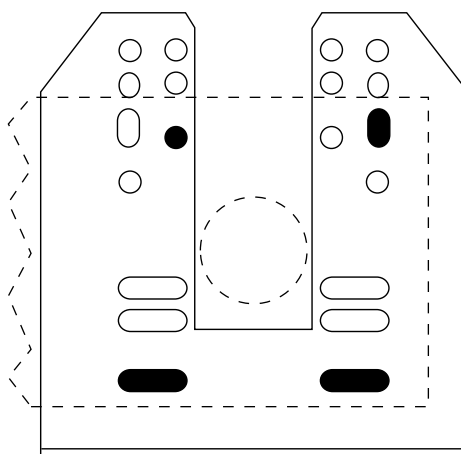


Barber Colman™ MA Type - Horizontal (right)

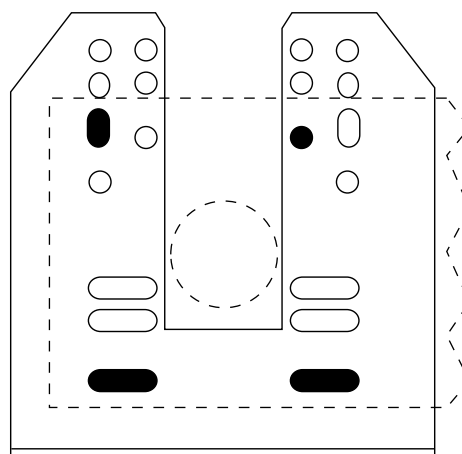
Black holes represent correct bolt locations.



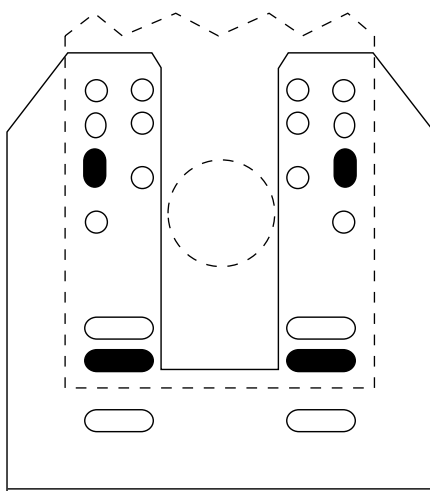
Honeywell™ Mod. IV Type - Vertical



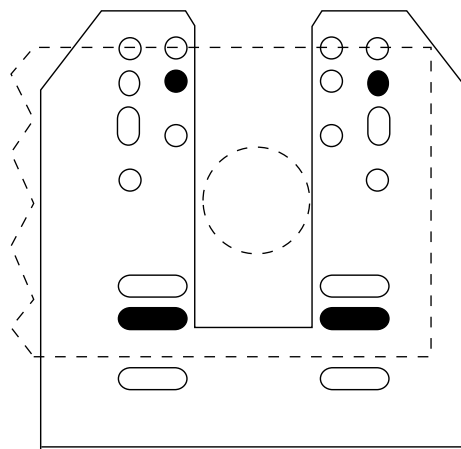
Honeywell™ Mod. IV Type - Horizontal (left)



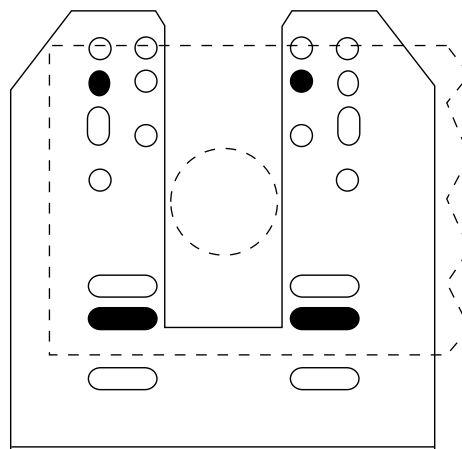
Honeywell™ Mod. IV Type - Horizontal (right)



**Johnson Control™ 100 Series Type
and Honeywell™ Mod. III Type
Vertical**



**Johnson Control™ 100 Series Type
and Honeywell™ Mod. III Type
Horizontal (left)**



**Johnson Control™ 100 Series Type
and Honeywell™ Mod. III Type
Horizontal (right)**



Application

The ZS-100 weather shield provides moderate protection to actuators which are mounted outdoors. This product is not designed as a water tight enclosure. The weather shield will work with all damper actuators.

Installation

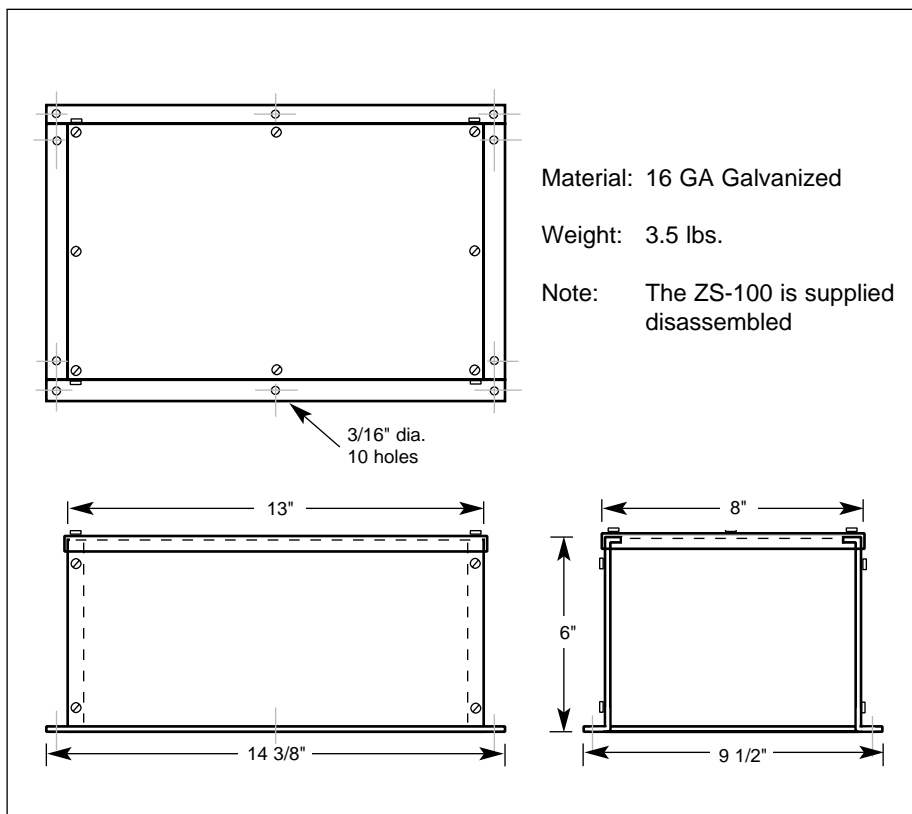
The ZS-100 weather shield is supplied disassembled. Supplying it in this manor makes it applicable to a wider range of field applications.

It may be assembled with 2 sides, 2 ends and the cover to completely conceal the actuator. A hole punch can be used to provide a hole to mount a wire conduit. A foam gasket is also provided to achieve a better seal between the cover and sides or from the base to the mounting surface. If desired, a side or end can be deleted from the assembly to provide easy access from the bottom of the enclosure.

General Instructions:

1. The actuator mounting strap must be shortened by 1 1/8 inches on both ends. (At the closest oblong slot to the end).
2. Install the actuator following the instructions for the actuator used.
3. Determine which side of the enclosure requires holes for wiring. To ease installation, holes should be made in the housing prior to assembly.
4. Assemble the ends and sides together first, then attach the cover.
5. If using the gasket, peel off the backing from the gasket and lay it onto the surface without stretching it. If stretched, it may pull loose with age.
6. Thread the wiring temporarily through the wiring hole(s).
7. Center the housing over the actuator and mount the housing to the mounting surface with self-drilling screws.
8. Remove the cover from the housing and install conduit/fittings to the housing.
9. Check the operation of the actuator prior to re-installing the cover.
10. Re-install the cover.

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Accessories

ZS-101 Base mounting plate

ZS-150 Weather Shield

For all damper actuators



Application

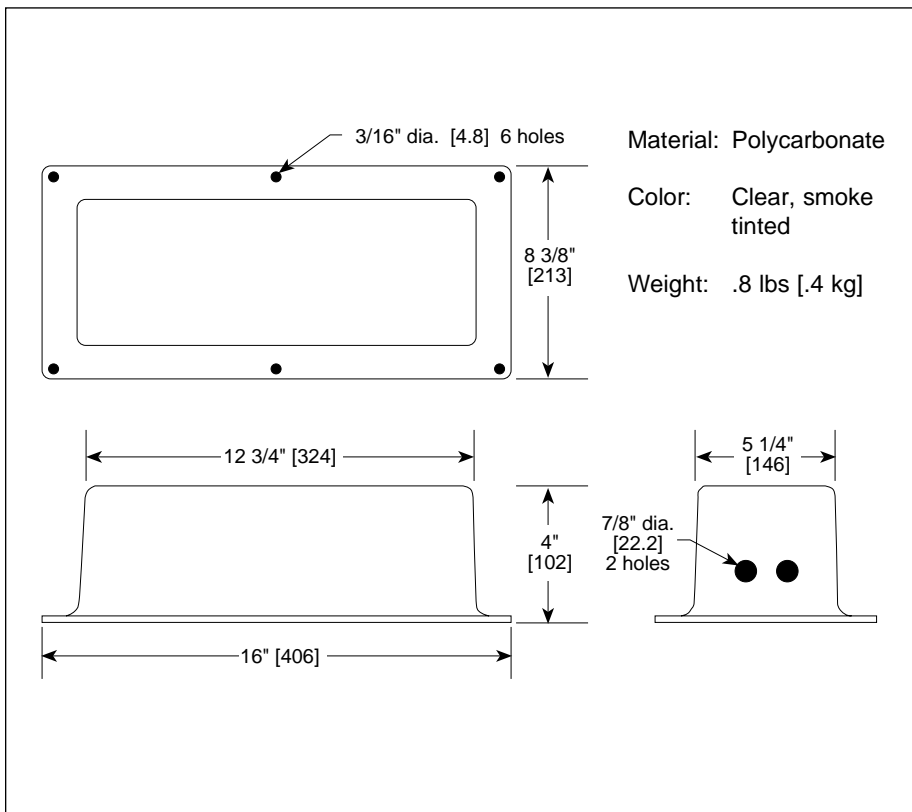
The ZS-150 weather shield provides moderate protection to actuators which are mounted outdoors. This product is not designed as a water tight enclosure. The one piece, smoke tinted, polycarbonate housing allows easy mounting over all damper actuators. The tinted, clear housing allows easy viewing of the actuator in operation.

Installation

The ZS-150 weather shield is supplied as a one piece enclosure. Two 7/8 inch wiring holes are pre-drilled to allow easy connections of conduit to the housing. If connections must be made to a different spot on the enclosure or only one hole is required, two plastic plugs are provided to seal the holes. A foam gasket is also provided to achieve a better seal between the base of the enclosure to the mounting surface.

General Instructions:

1. The actuator anti-rotation strap must be shortened by 2 inches on both ends.
2. Install the actuator following the instructions for the actuator used.
3. If using the gasket, peel off the backing and lay it onto the housings flange surface without stretching it. If stretched, it may pull away with age.
4. Attach the conduit fitting(s), if used, to the housing and thread the cable(s) through the fitting(s).
5. Center the housing over the actuator and fasten the housing to the mounting surface with self-drilling screws.





Application

The ZS-260 explosion-proof housing may be used with the GM..., AM..., SM..., AF..., NF..., LF... series actuators. This housing is not designed for direct coupling. It is for use in Class I, II and III hazardous locations, and to meet the requirements for NEMA 4, 7 & 9 type enclosures.

Operation

The ZS-260 enclosure is designed so that the required actuator may be easily field mounted into the enclosure. The actuator is fastened on to the internal portion of the operating shaft and secured at the end with an anti-rotation strap. A crank-arm, such as the KH8, is mounted to the external portion of the operating shaft for connection to connection to the damper linkage. ZG-109 right angle, and ZG-110 standoff mounting brackets may be used (see back).

The ZS-260 is designed so that the operating shaft can be mounted on either the front or rear side of the housing.

Accessories

- KH8 Universal crankarm
- KG8 Universal ball joint
- KG10 Universal ball joint
- ZG-109 Right angle mounting bracket
- ZG-110 Stand-off mounting bracket

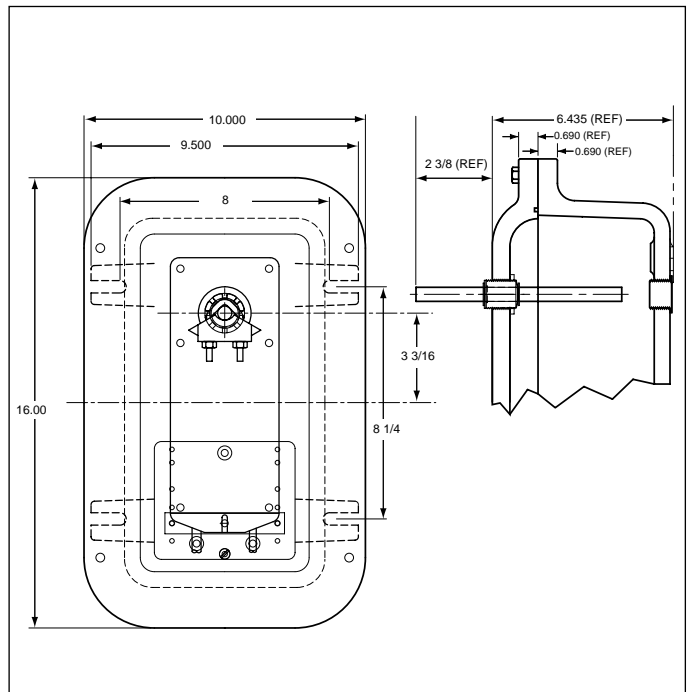
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Technical Data	ZS-260
Material	Housing: cast, copper-free, aluminum, Cover bolts: stainless steel Operating shaft: stainless steel
Conduit holes	3/4"-14 NPT (2 supplied) see Note 1
Operating shaft diameter	1/2 inch
Operating shaft location	Front or rear side of housing (Field selected)
Approved applications	UL & CSA, Class I, II & III; Group B, C, D, E, F & G NEMA 7, Class I, Groups B, C & D NEMA 9, Class II, Groups E, F & G NEMA 4
Weight	31.0 lb. (14.0 kg) without actuator

Note 1: Fittings that meet the requirements of the hazardous location must be used. All applications must comply with applicable local and/or national electric code.

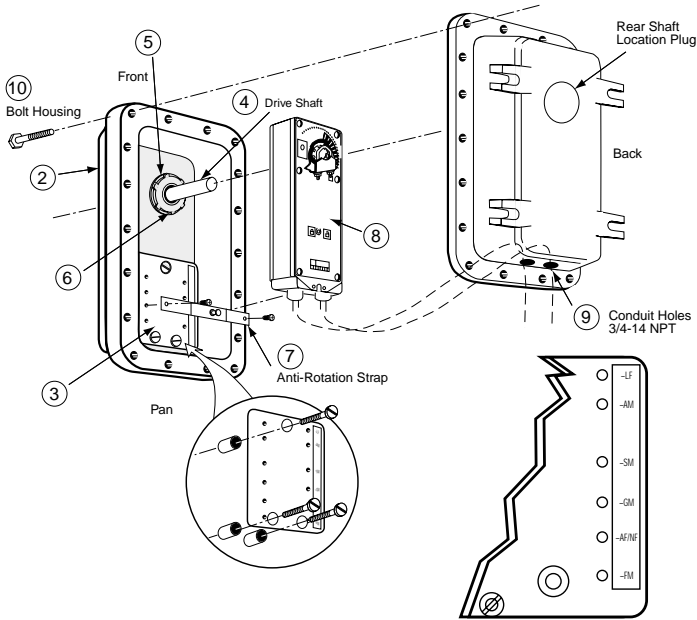
Note: Since conditions of use of this product are outside the control of Belimo, the purchaser should determine suitability of the product for their intended use, and assumes all risk and liability in connection therewith.

Dimensions (All ratings in brackets are metric.)



Mechanical Accessories

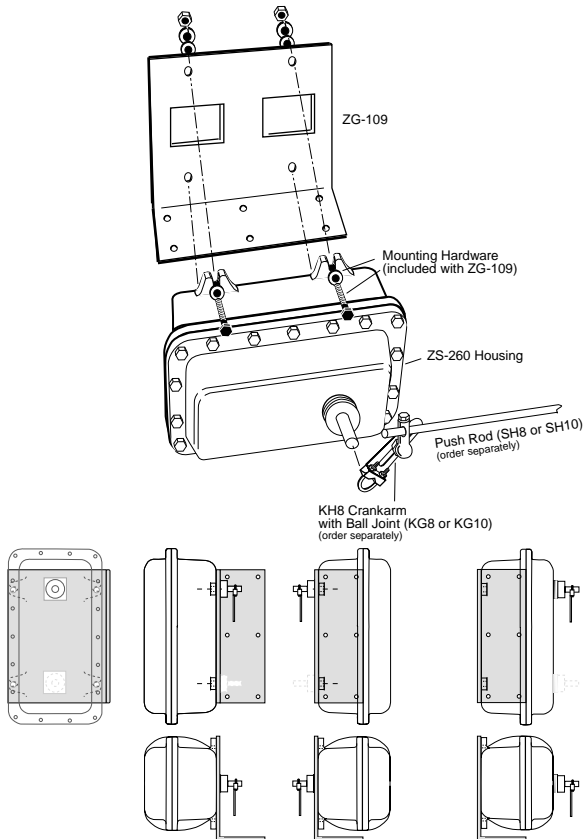
ZS-260 Shaft Thru Front



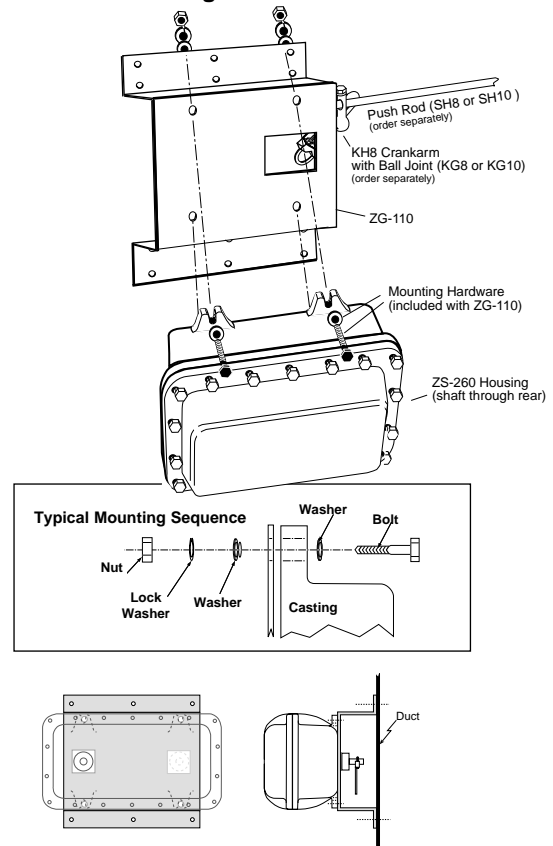
ZS-260 Mounting Instructions

1. Determine proper operating shaft location.
2. Remove threaded plug from the hole in which the operating shaft will be mounted.
3. Install the anti-rotation strap, mounting plate, to the side of the housing where the operating shaft will be mounted.
4. From the inside surface of the housing, insert the operating shaft, short length first, into the mounting hole.
5. Hand tighten the shaft bushing into the housing until the star nut/seal is in contact with the face of the housing.
6. Using a screw driver blade, drive the star nut/seal clockwise until the bushing is locked into place.
7. Install the anti-rotation strap into the mounting plate at the designated holes for the actuator to be used.
8. Install actuator
9. Wire actuator (per electrical code).
10. Bolt housing together

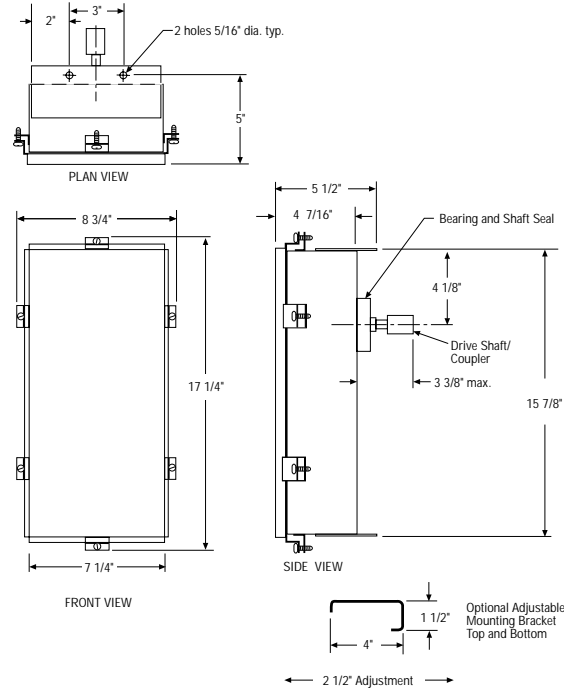
Typical ZG-109 Mounting



Typical ZG-110 Mounting



ZS-300



ZS-300 NEMA 4X Housing

For AM, SM, GM, AF, NF, LF Series Actuators

Application

The ZS-300 (-1) NEMA 4X enclosures may be used with SM, GM, AM, AF, NF and LF Belimo actuators. They are intended for use primarily to provide protection against corrosion, windblown dust and rain, splashing water, hose-directed water; undamaged by the formation of ice on the enclosure. Type 304 stainless steel enclosures resist moisture, dust, salt, and corrosive chemicals, and are easy to keep clean for sanitary applications.

Operation

The ZS-300 enclosures are designed so that the required actuator may be easily mounted in the enclosure. The operating shaft and coupling are inserted from the backside through the rotating shaft seal. The actuator is fastened on the end of the operating shaft and secured at the end with an anti-rotation strap. Adjustable mounting brackets, if supplied, are assembled to the fixed mounting holes at the top and bottom of the enclosure with stainless steel nuts, bolts and lock washers. The direct drive coupling is designed for a 1/2" round or hexagonal shaft and secured with two square head set screws. Mounting brackets are adjusted and secured in place.

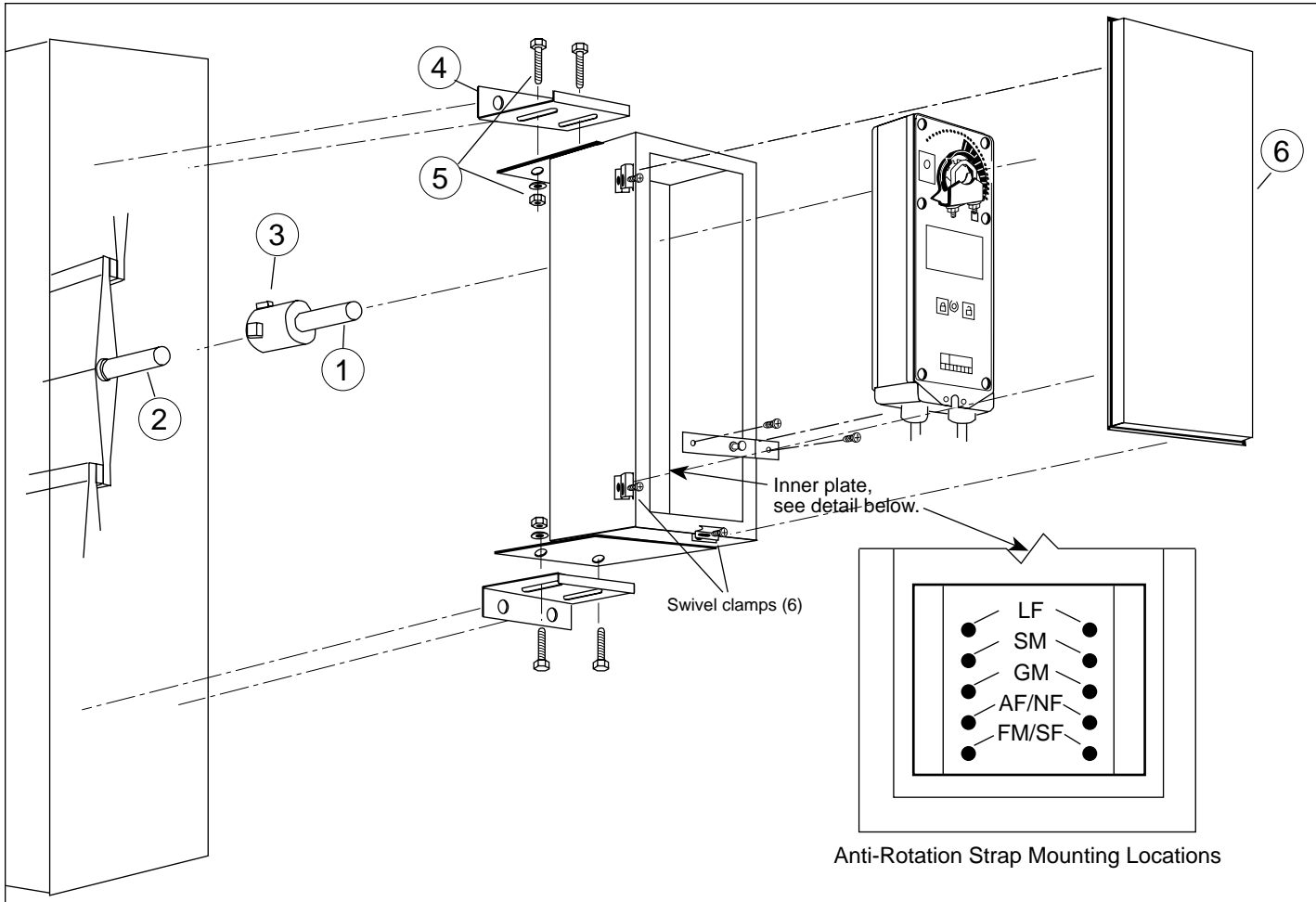
Ordering Information

ZS-300	Housing with mounting brackets
ZS-300-1	Housing without mounting brackets
ZS-300-5	316L enclosures, custom mounting brackets and operating shaft/couplings are available. Consult Belimo.

Accessories

ZS-300-BK	Mounting bracket set
ZS-300-C1	1/2" shaft adaptor (standard with housing)
ZS-300-C2	3/4" shaft adaptor
ZS-300-C3	1" shaft adaptor

Technical Data	ZS-300 (-1) (-5)
Material	All 304 stainless steel housing, door, (with neoprene gasket), shaft, coupling, universal mounting plate, and hardware.
Conduit holes	Field drilled as required. U.L. listed electrical fittings for NEMA 4X conditions must be used.
Operating shaft	1/2" by 5 15/16" long 304 stainless steel with integral coupling for direct mounting to 1/2" round or hexagonal drive shafts. Square head set screws are 304 stainless steel.
Optional shafts (Ordered separately)	ZS-300-C1 1/2" shaft adaptor (standard with housing) ZS-300-C2 3/4" shaft adaptor ZS-300-C3 1" shaft adaptor
Rotating shaft seal	Machined PVC hub, bronze oilite bearings, 10 PSI, Nitrile, bi-rotational, hydrodynamic, radial lip Wave seal.
Industry standards	The Belimo ZS-300 NEMA 4X enclosure and Belimo model SM, GM, AM, AF, NF and LF are U.L. listed as an assembly. These enclosures conform to the NEMA standard for Type 4X (water-, dust-tight and corrosion resistant).
Weight	11 lbs. [5 kg] without actuator or mounting brackets.



ZS-300 Mounting instructions

1. The damper operating shaft should extend approximately 1 1/2 inches from the damper assembly or duct side. Mount the drive shaft/coupler ① to the damper operating shaft ②. Fasten the coupler to the damper operating shaft by tightening the two 3/8 inch square head set screws ③.
2. Determine the housing mounting orientation for the application.
3. Locate the housing hole position(s) for the control wiring of the actuator.
4. Make the necessary holes in the housing for the electrical fittings. All fittings must be rated for use in NEMA 4X applications.
5. Install (if ordered with) the 2 mounting brackets ④ to the housing using the four 1/4-20 screws, washers, and nuts ⑤. Do not tighten.
6. Carefully slide the housing over the drive shaft.
7. Place the housing in the desired mounting position. Transfer the mounting hole locations from the mounting bracket to the mounting surface.
8. Drill the 4 holes and fasten the brackets to the surface.
9. Install the anti-rotation strap to the housing in the correct location for the actuator which is being used.
10. Mount the actuator to the drive shaft using the instructions for the actuator being used. Finger tighten the nuts of the universal clamp. Make sure the back of the actuator is parallel to the back of the housing.
11. The operating shaft must pass through the mounting clamp at least 3/8 of an inch. It must not extend beyond the front of the housing. Slide the actuator/housing assembly in the mounting brackets to obtain the proper position.
12. Tighten the mounting brackets to the housing. Verify that the back of the actuator is still parallel to the back of the housing. Tighten the nuts on the universal clamp.
13. Make all of the required electrical connections.
14. Test the actuator/damper operation.
15. Fasten the housing cover ⑥ using the 6 swivel clamps.