

Installation, Operating & Maintenance Instructions

Description

The A-60 Marine Fire Damper is tested and approved for fitting to class A-60 divisions (bulkheads and decks), when suitably insulated (see page 2 for details).

Tests and Approvals

A60 Fire Rated.
Lloyds Register of Shipping Approved.
Marine Equipment Directive Compliant.
USCG Approved.
Germanischer Lloyds Approved
Det Norske Veritas Approved.
American Bureau of Shipping Approved to max size of 750mm x 750mm for single dampers, 1580mm x 750mm for 2x1 multiple dampers.
Corrosion Tested.
Vibration Tested.

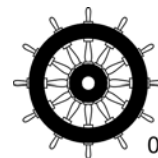
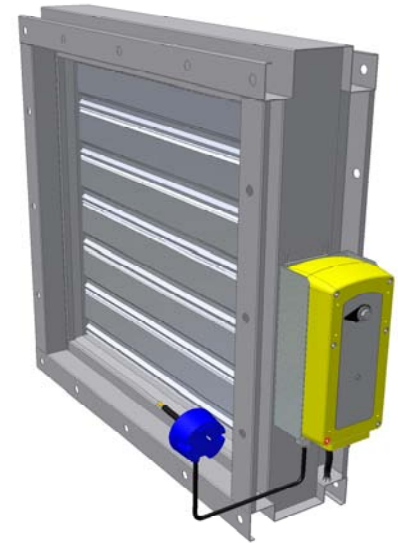
Health and Safety

Care must be taken when installing and inspecting dampers, as they are likely to close without warning due to loss of electrical power, or a temperature rise in the ductwork. This is their prime function.

Do not introduce any items, fingers or limbs between the blades.

Larger dampers are heavy and must be handled in accordance with current regulations and good practice.

All wiring should be carried out in accordance with the wiring details provided, to the IEC regulations.



0038/YY

YY Denotes last two digits of year
the Wheelmark is affixed to damper

General Information

The A-60 Marine Fire Damper is suitable for both vertical and horizontal applications, with airflow in either direction. The dampers which are A60 fire rated to IMO fire test procedures Code, Annex 1 Pt 3, are normally open, and fail-safe to the closed position. The A-60 Marine Fire Dampers are supplied with the blades in the fully interlocked closed position to avoid damage during transit and installation. It is recommended that the dampers remain closed until actual date of commissioning. All fire dampers are life safety products and should be treated with care during handling, storage and installation. A-60 Marine Fire Dampers are designed for applications in normal dry filtered air systems and should be subjected to a planned inspection programme, with cleaning and light oil lubrication to blades, casing and actuator, in accordance with good industry practice. When exposed to fresh air intakes and/or inclement conditions this may need to be performed more regularly based on experience gained from previous inspections.

Testing-Maintenance and cleaning A-60 Dampers are supplied in 2 casing and blade options:-

1. 430 Standard steel blades, Galvanised Steel casing - only suitable for installation in dry filtered systems.
2. 316 Standard steel blades, casing and drive - more suited for corrosive conditions, but even this will rapidly corrode and fail if not properly maintained, when used in air intake systems at sea. The addition of a mist eliminator is highly recommended and access must be provided for maintenance.

Pay particular attention to the blade rivets, where crevice corrosion will cause rapid failure of blades if not kept in check.

Testing Two levels of testing exists.

1. Routine testing

Monthly, or in accordance with maintenance programme, release and reset damper (via control system or ETR test switch). Check remote indication or visual check of mechanical pointer as appropriate.

2. Visual check at damper

At commissioning and at least once a year, check damper operation by removing and re-applying power to actuator. (via ETR test switch). Visually check blades for damper closed and open positions. Prove remote indication if applicable.

Routine Maintenance

Depending upon environmental conditions, each damper will merit its own cleaning regime. Particularly hostile areas may require monthly cleaning and lubrication.

'Frequency of maintenance' should be determined by collecting historical data from previous visits, and for this reason, commence maintenance programmes at very frequent intervals. Dampers in **'Dry Filtered Air'** require very limited maintenance.

Using Duck Oil (recommended lubricant, or similar equivalent), clean all exposed surfaces, using a cloth. Remove all traces of surface staining, as this will deteriorate further causing deeper material corrosion.

If damper is stiff to operate, lubricate blade ends and open and close damper successively until the damper moves with ease. (This may necessitate removal of the actuator and operating the blades manually by the drive shaft). Refit actuator, and re-test. Clean off excess lubricant.

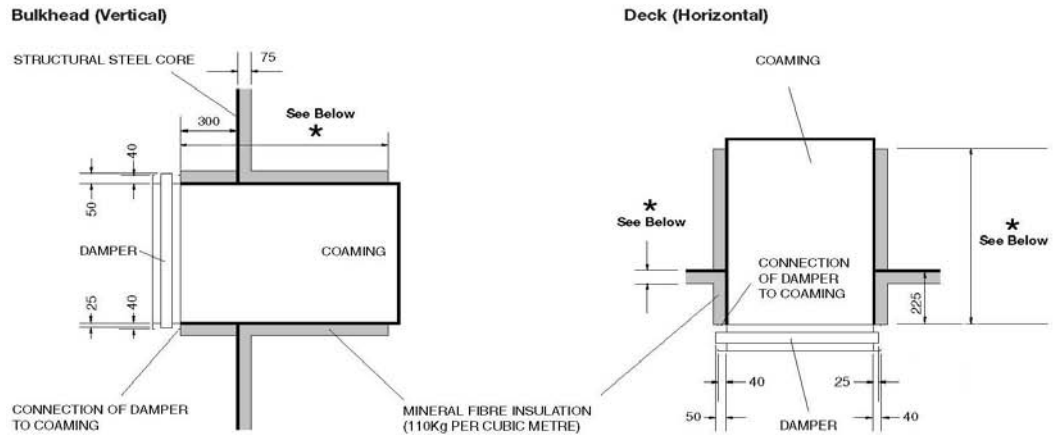
A-60 Marine Fire Damper

Damper installation

All installations must be carried out in accordance with the relevant Marine/Offshore Authority requirements.

The damper should be installed in accordance with Insulation details (as shown) that represents a typical A-60 installation. Bolt holes are provided as standard on the damper flanges (unless otherwise stated) at 150mm maximum centres. Matching hole positions are necessary on mating coaming/duct flanges. Apply approved fire resistant sealant/gasket to mating flanges and position damper. Bolt damper using M8 minimum diameter steel bolts, at a maximum of 200mm centres.

Insulation Details:

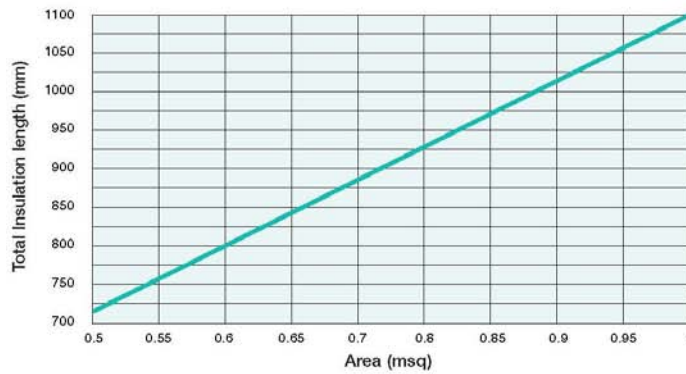


* Table of Minimum Total Coaming Insulation Length (Applies to all approval bodies)

Application	Insulation Thickness	Minimum Total Insulation Length
Vertical bulkhead up to 750 x 750 (0.5625msq)	75mm	725mm
Vertical bulkhead above 0.5625 msq		refer to graph below
Horizontal deck up to 750 x 750 (0.5625msq)	40mm	725mm
Horizontal deck above 0.5625 msq		refer to graph below
Horizontal deck (all sizes)	75mm	725mm

The same area/insulation criteria applies for multiple arrangements

Graph Showing Minimum Insulation length for Damper above 750mm x 750mm Base Damper (Applies to all approval bodies with the exception of ABS)



Coaming Insulation Example

For a damper size of 910mm x 925mm.
Area = 0.85 msq

Vertical Installation

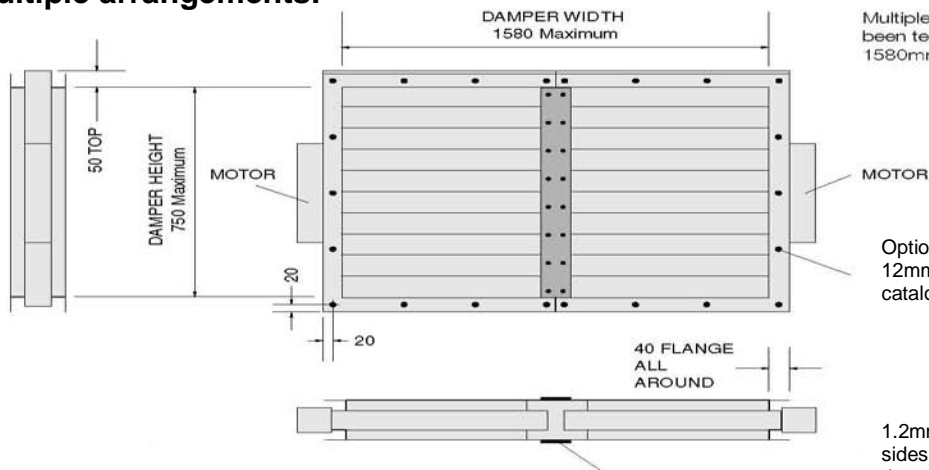
Insulation Thickness = 75mm (line 2 of table)
Insulation Length = 975mm (refer to graph)

Horizontal Installation

Insulation Thickness = 40mm (line 4 of table)
Insulation Length = 975mm (refer to graph)
Insulation Thickness = 75mm (line 5 of table)
Insulation Length = 725mm (line 5 of table)

Note: for circular, use square base damper area.

Multiple arrangements:



Multiple width assemblies (2 x 1) have been tested and approved to a size of 1580mm wide x 750mm high.

Optional 12mm dia flange holes, both sides. See catalogue for bolt hole locations.

1.2mm Steel x 75mm wide joining strips (both sides) Riveted with 3.2mm diam (Min) steel rivets at 100mm centres. on site by others

ATEX rated Electrical Control Mode

1st Step notes:

For motor running times less than 30s the self-adjustment drive is obligatory.
 Never operate the manual override (shaft) when actuator is connected to power supply.
 Actuators will only work if STS - FireSafe sensor is properly connected.
 In case of using 3 second motor running time, make sure that 1 cycle per minute is not exceeded.

Mechanical Operation check

As an interim check, the damper should be manually reset and released using the manual reset key provided, (refer to Control Mode label) to ensure that correct mechanical operation is achieved.

Safety Temperature Sensor (STS) Installation

(When not affixed to damper casing, 210mm wide casing option only)

- Select a suitable position for the STS on the duct as follows:
 - Deck Installations – Must be anywhere below the damper.
 - Bulkhead installations – Ideally this should be anywhere in the top half of the duct.
- Position the self-adhesive fusible link drilling template label provided in the appropriate position on the duct.
- Using a 5.5mm dia bit, drill the two STS fixing holes, place the nylon inserts into holes.
- Using a 10mm dia drill, drill the central hole.
- Remove sharp edges.
- Push the STS through the duct and ensure that both screws are used to hold it securely in position.

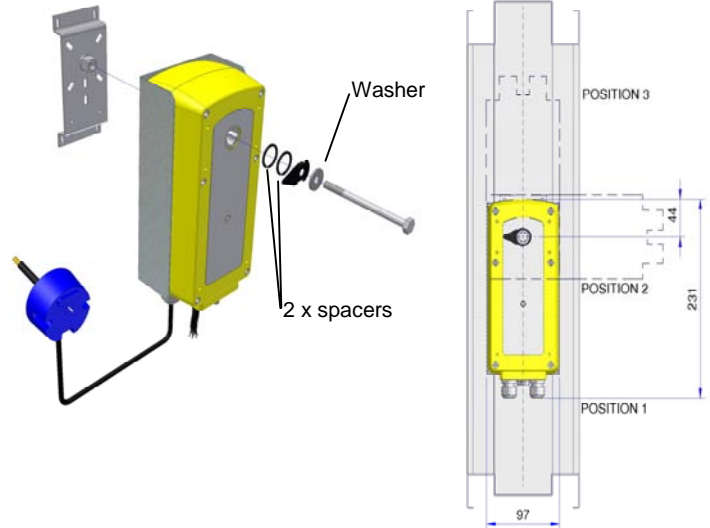
The STS cable must not be shortened, and care must be taken not to damage it.

Electrical Connection and Final Operational Test

The unit must be wired as described in the Application and Wiring section, page 4.
When power is available, the unit must be checked for electrical operation. Power on to motor open, power off to spring close. The unit must also be checked by moving and holding the test switch on the ETR to confirm that the damper closes. When pressure is removed from the switch the damper will re-open. This may be done after the initial installation test, to provide periodic operation of the damper to simulate actual fail-safe closure under fire conditions.

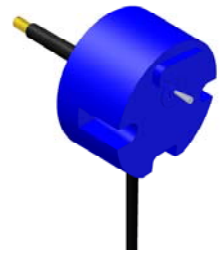
Note:

ExMax actuators are equipped with a universal supply unit working at a voltage range from 24 to 230 VAC/DC. The supply unit is self-adjustable to the connected voltage! The safety operation of the spring return function works if the supply voltage is cut. For electrical connection inside hazardous areas, an EEx-e terminal box, certified in accordance with ATEX is required (E.G ExBox XNNN00578)



EEx-I Safety temperature sensor (STS)– FireSafe

The safety thermostat type FireSafe is passive and potentially free for use in intrinsic safe circuits, directly connectable to the EEx-I circuit of the ExMax-15-BF actuator. The sensor switches at an ambient temperature of 72 degrees C, and starts the fail-safe spring return function of the actuator. Sensor with manufacturer certificate in accordance with ATEX.



A manual test switch allowing periodic operation of the damper for testing purposes simulates actual fail-safe release under smoke/fire conditions. End switches are provided with each Mode for reset and release monitoring.

Power input depending of supply voltage

Power supply design

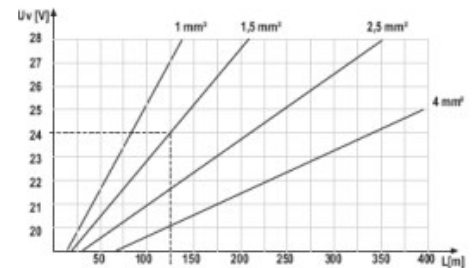
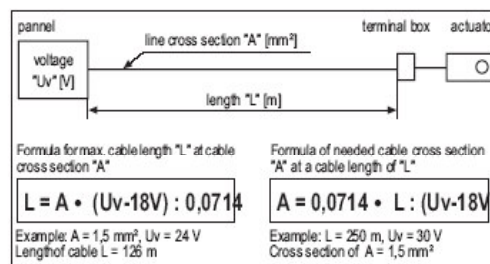
The design of the on-site supply, depends on the selected motor running time and selected supply voltage. Accompanying values are "about values", since there can be construction unit dispersions within electronics. The power consumption in the blocking position is run time independently with max. 20 W. The power consumption for the heater is approx. 16W. The heating is running only if the motor is in idle position! The initial starting supply voltage required by the actuators power supply unit is around 2,0 A for about 1 Sec. (Please consider this while conceiving the cross section of the supply line)

Voltage	Current	Rated current in acc. with motor running time				
		3/7,5s	15s	30s	60s	120s
230 V	Isolated	0,5 A	0,3 A	0,15 A	0,10 A	0,10 A
120 V	Isolated	0,75 A	0,4 A	0,3 A	0,25 A	0,25 A
48 V	Isolated	2,0 A	0,5 A	0,3 A	0,2 A	0,2 A
24 V	Isolated	4,7 A	1,45 A	0,52 A	0,4 A	0,4 A

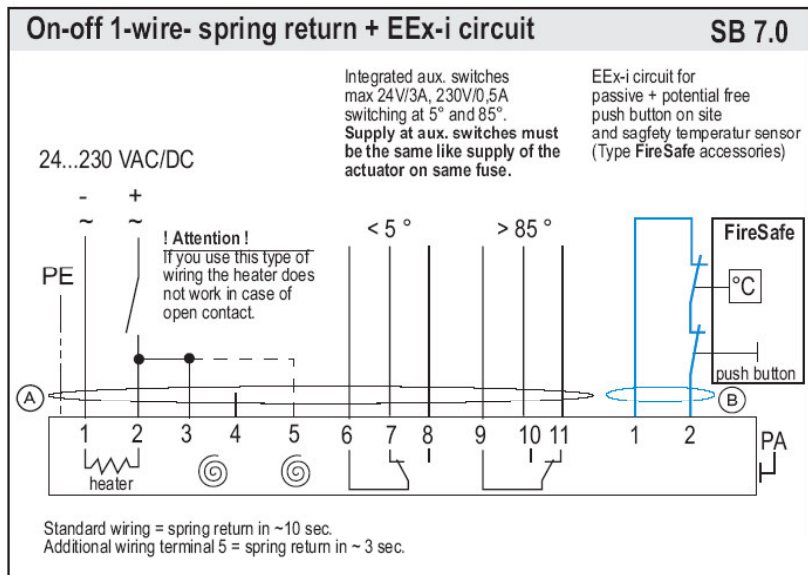
Dimensioning of the line cross section with 2448 VAC/DC supply voltages

Dimensioning/Design of the supply line

On long distances between voltage supply and drive, voltage drops occur due to line resistances. As a consequence with 24 VAC/DC the actuator receives a too low tension and does not start. In order to prevent this, the cross section of the inlet line is to be designed/dimensioned accordingly. The accompanying formula allows the calculation of the necessary line cross section, perhaps provides the maximally permitted conduit length utilizing the existing line cross section. Alternatively the secondary voltage can be increased by selecting a transformer. For calculation purposes, following characteristics are essential:
 Uv = supply voltage in [V]
 A = line cross section in [mm²]
 L = conduit length in [m]
 Factor 0.0714 = drive-specific factor
 [Vmm²/m] (based on the electrical conductivity of electrolytic copper with a coefficient of 56mV/mm²)



Example:
 24 V power supply with wire diameter 1,5 mm² = 126 m



EEx-i intrinsic safe data			
U_0	10,6 V		
I_0	11 mA		
P_0	30 mW		
C_i	0		
L_i	0		
	IIC	IIB	IIA
C_0	830 nF	3,7 μF	4,5 μF
L_0	2 mH	5 mH	10 mH

Troubleshooting

Fault	Possible problem	Recommended action
Control Mode does not fit to damper drive shaft when Control Mode is correctly positioned	Damper shaft not in 'damper closed' position	Damper shaft has an 'indication groove' which is parallel to damper blades. Damper must be in closed position before fitting Control mode.
Control Mode does not operate electrically	STS not correctly fitted	Refer to Page 3.
	Mode wired incorrectly / No power	Refer to above wiring diagram
	STS activated	Replace STS.
Control Mode operated, but limited or no movement of damper blades evident	Damper/Control Mode positions not synchronised	Remove Control Mode. Check damper closed (see indication Groove on damper shaft), and Control Mode released. Refit Control Mode.
	Obstruction impeding damper blade	Check visually, remove obstruction. If necessary, remove Control Mode and operate damper drive shaft with 14mm A/F spanner.
	Over tightening of M5 x 80mm screw. (3 position only)	Loosen screw to 5Nm torque.

actionair
no compromise...

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