

Actionair A-60 Marine Fire Damper

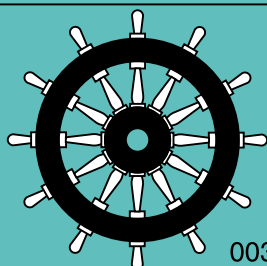
Designed for inclusion in
Marine and Offshore Projects

Tests and Approvals

A60 Fire Rated.
Lloyds Register of Shipping Approved.
Marine Equipment Directive compliant.
USCG Approved.
Germanischer Lloyds Approved.
American Bureau of Shipping Approved.
Corrosion Tested.
Vibration Tested.

Features

Lightweight, cost effective design.
Rectangular and Circular Flanged casings.
Galvanised and 316 Stainless steel casing options.
430 stainless steel and 316 stainless steel blade options.
Electrical actuator option
~ 60 second reset time.
Unique and patented Electrical Thermal Release for ultimate safety
'Healthy' indication light when fully functional
Multi-position mounting.
Pneumatic actuator option
~ 3 second reset time
Pneumatic Thermal release
Solenoid options
Status beacon/switchbox options.



0038/YY

YY denotes last two digits of year that Wheelmark is affixed to damper.

Dampers Designed and Built in UK



*action*air

www.actionair.co.uk

Introduction

Actionair has, for many years, been associated in the design, development and manufacture of life safety equipment, including the supply of fire damper products to the offshore and marine industry. The Actionair A-60 Fire Damper has been specifically engineered to meet stringent legislation.

The A-60 Marine Fire Damper compliments the comprehensive range of automatic fire and smoke dampers and associated

controls, provides the complete solution for shipboard air conditioning and ventilation systems fire safety engineering strategies.

The A-60 Marine Fire Damper has been designed for inclusion in air conditioning and ventilation systems and is tested and approved for fitting to class A-60 divisions (bulkheads and decks), when suitably insulated (refer to insulation details).

Specification

The Actionair A-60 Marine Fire Damper is constructed from galvanised steel 1.2mm thick, 40mm flanged rectangular or circular casing, (316 stainless steel option available).

75mm interlocking 430 grade stainless steel aerodynamic blades, steel blade end bearings and 300 grade stainless steel peripheral gasketing. (316 grade stainless steel blade and blade end bearing available). The totally enclosed precise movement opposed blade drive is positioned out of the airstream for protection against damage, and is hard wearing and free running.

Electrical

The Actionair direct-coupled spring return fail-safe electrical control modes are fitted with halogen free low smoke and fume electrical cable. They have a 60 second reset time and a 20 second release time. Each actuator has a 72°C rated electrical thermal release (ETR). The ETR incorporates a safety electrical interlock that only permits actuator operation when correctly fitted.

A green 'Healthy' indication lamp is built into the ETR housing to give a simple and clear visual check that the actuator is receiving power, the ETR is correctly fitted, and the thermal fuse is intact.

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.

Pneumatic

The Actionair direct coupled spring return fail-safe pneumatic control mode requires an air pressure of between 5 to 8 bar (72 to 116 psi) to operate. They have 3 second reset and release time. Each actuator has a pneumatic thermal release (PTR).

The PTR assembly is supplied with 500mm nylon tubing that connects to the quick fit couplings of the PTR and actuator. Incorporated is a fail-safe 74°C fusible link. When this operates, air exhausts from the actuator, permitting the spring return actuator to go to the fail-safe position, thus closing the damper. Switch box and solenoid accessories are available for monitoring and control.

Approval list

- Lloyds Register of Shipping Approval to IMO Fire Test Procedures Code, Annex 1, part 3, for Class A60 bulkheads and decks.
- Marine Equipment Directive 96 /98 /EC.
- USCG approved (product category 164.139).
- Germanischer Lloyds Approved to IMO Res. A.754. (18) and IMO Res. MSC61(67), Annex 1 Part 3.
- American Bureau of Shipping Approved to: 2005 Steel Vessel Rules 1-1-4/7.7. Please note maximum size restrictions - see page 3.

All certificates are available via the Actionair website. www.actionair.co.uk

Range and Application

The A-60 dampers can be used where the maximum system pressure is up to 1500 Pa and duct velocities to 15m/s.

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 in accordance with good industry practice. When exposed to fresh air intakes and/or inclement conditions please refer to Actionair Technical Sales Office.

The A-60 Marine Fire Damper is suitable for both vertical and horizontal applications, with airflow in either direction. The dampers are normally open, and fail-safe to the closed position.

Electrical



Fail-safe is by means of a unique and patented Electrical Thermal Release (ETR) which operates at 72 °C, or if power supply is interrupted. The ETR incorporates a safety feature, that ensures the fail-safe status of the damper if the ETR is not fitted on to the ductwork. Additionally a green LED lamp is built into the ETR housing. This gives the user a simple and clear visual check that the Actuator is receiving power, the ETR is correctly fitted, and the thermal fuse is intact.

A manual test switch allows periodic operation of the damper for testing purposes, simulating actual fail-safe release under fire conditions.

The associated electrical control modes are available in 24 Volt, 120 Volt or 230 Volt versions.

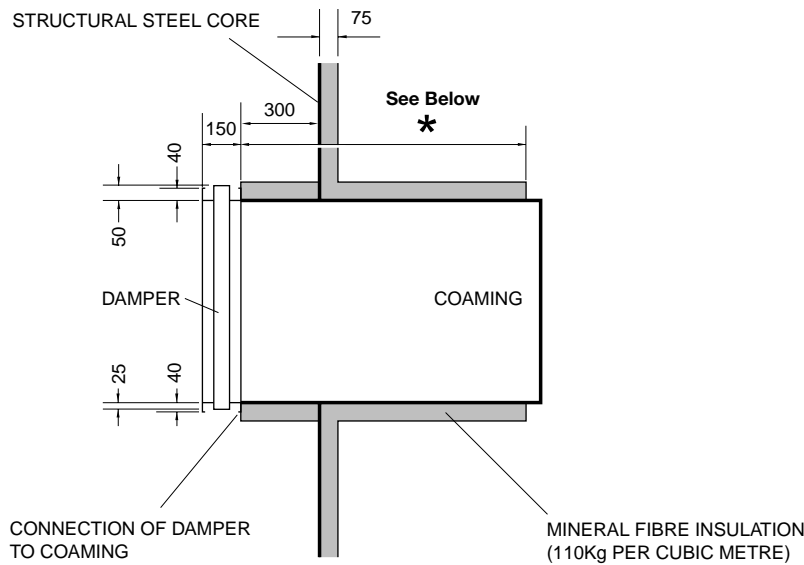
Pneumatic



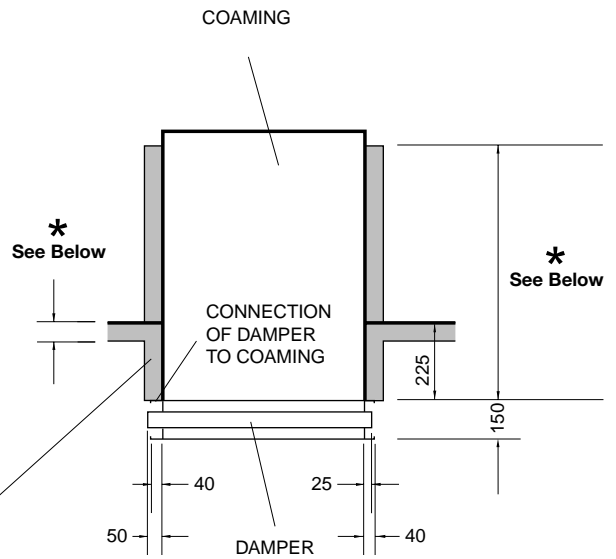
The special purpose design Pneumatic Thermal Release (PTR) assembly is supplied with 500mm nylon tubing that connects to the quick fit couplings of the PTR and actuator. Incorporated is a fail-safe 74°C fusible link. When this activates, air exhausts from the actuator, enabling the PTR to spring return to the fail-safe position, thus closing the damper.

Insulation Details

Bulkhead (Vertical)



Deck (Horizontal)



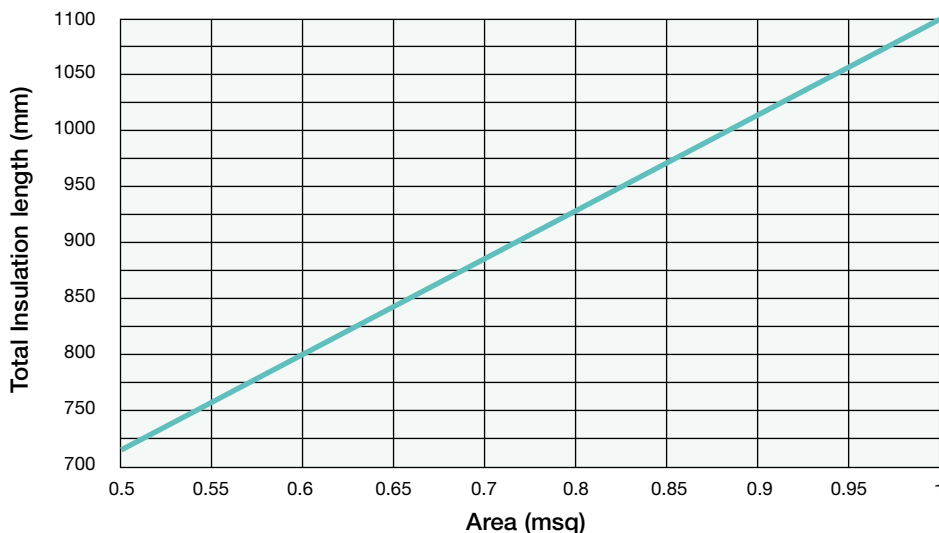
*** Table of Minimum Total Coaming Insulation Length** (Applies to all approval bodies)

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.

Testing

The Actionair A60 marine fire damper has undergone extensive fire testing in single and multiple arrangements. The dampers were incorporated in steel bulkheads and decks and tested to the Marine Fire Resistance Test in accordance with IMO resolution A754. (18) for a duration of 60 minutes.

Changes to the originally supplied product may invalidate the certification and/or warranty.

Certification

EC Type Examination (Module B) Certificate.

EC (Module D) Certificate of Conformity.

Certificate of Fire Approval.

Germanischer Lloyds Fire Certification.

ABS Approved.

ISO 9001; 2000 Certification.

•Corrosion Tested to BSEN 60068-2-52, severity 2 conditions.

•Vibration Tested to BS EN 60068-2-6 (5Hz to 350Hz @ 2g).

All Certification and Test Reports are available by contacting the Actionair Sales Office.

Changes/modifications to the original supplied product may invalidate certification and/or warranty.



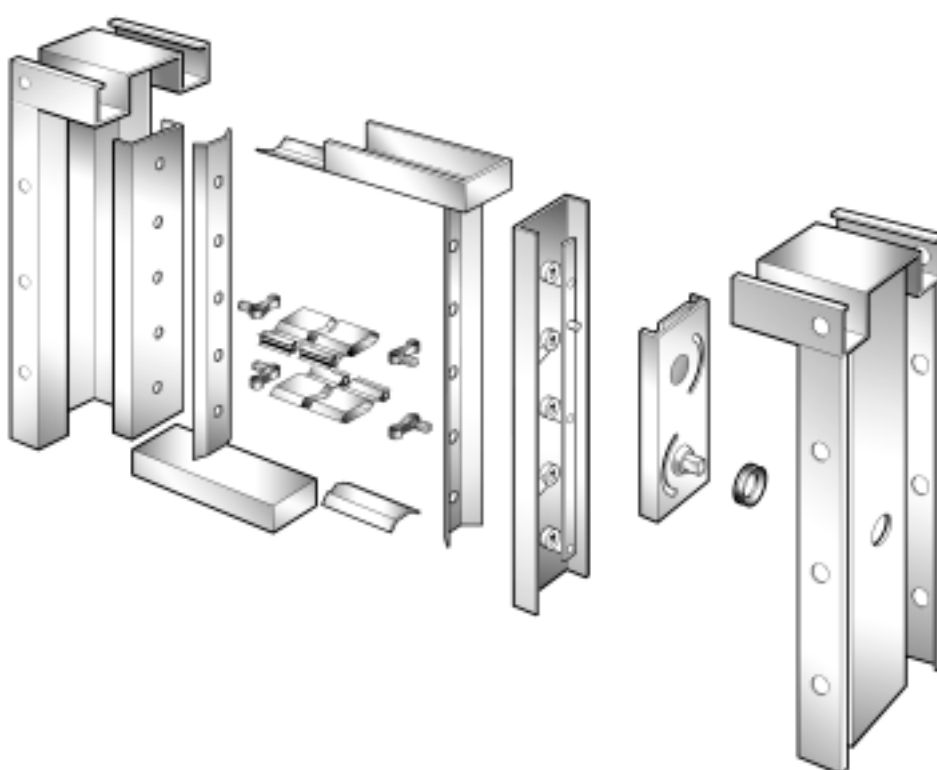
Casing Features

The standard 1.2mm galvanised steel flanged type casing, having a single penetration for the drive control, complies to Class A & B of Eurovent 2/2 and Test Procedures for Classes A, B, & C of the HVCA Ductwork Specification DW144. Pre-punched bolt holes are provided as standard (refer to page 7 and 8).

In addition Stainless Steel peripheral gasketing is included, which allows for expansion under full fire conditions.

The 1.2mm casing has obvious benefits, for example being lighter in weight, allowing easier installation.

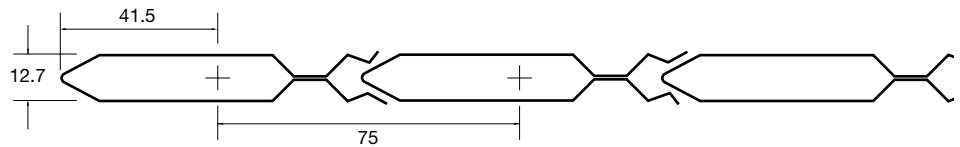
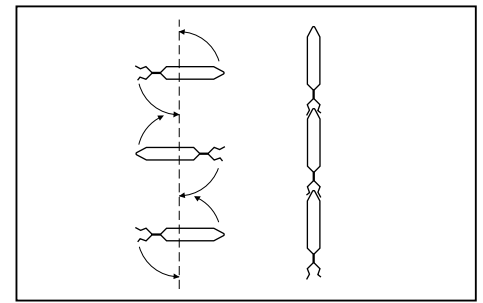
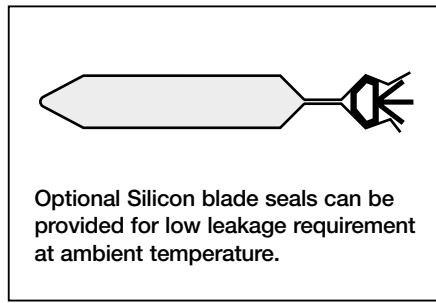
Casings manufactured in Type 1.4401 (316 grade) Austenitic Stainless Steel are available as an optional extra.



Blade Features

The damper blades are aerodynamic double skin, type 1.4016 (430 grade) Ferritic Stainless Steel, which are 75mm wide and when closed interlock to form a positive fire resisting shield. Incorporated in the blade are steel blade end bearings.

Optional blades in Type 1.4401 (316 grade) Austenitic Stainless can be provided. Incorporated in the blade are 316 Stainless Steel blade end bearings.



Control Modes

The IP54 rated Control Modes, are located outside of the ductwork for ease of access and installation.

Control Modes fitted to dampers up to 400mm high, can be fitted in any one of three orientations i.e. vertically down, horizontally or vertically up. Positions 1, 2, or 3).

Two sizes (Compact and Universal) of Control Mode are utilised.

This flexibility ensures that the smaller damper sizes and Control Mode require the minimal amount of room. For damper sizes above 400mm high the control mode is fitted vertically.

Correctly sized Control Modes are designed to fit only to the relevant sized damper.

The control modes are direct coupled to the damper utilising a unique user friendly positive connection system. This allows the dampers and actuators to be supplied separately, offering shipping and storage benefits.

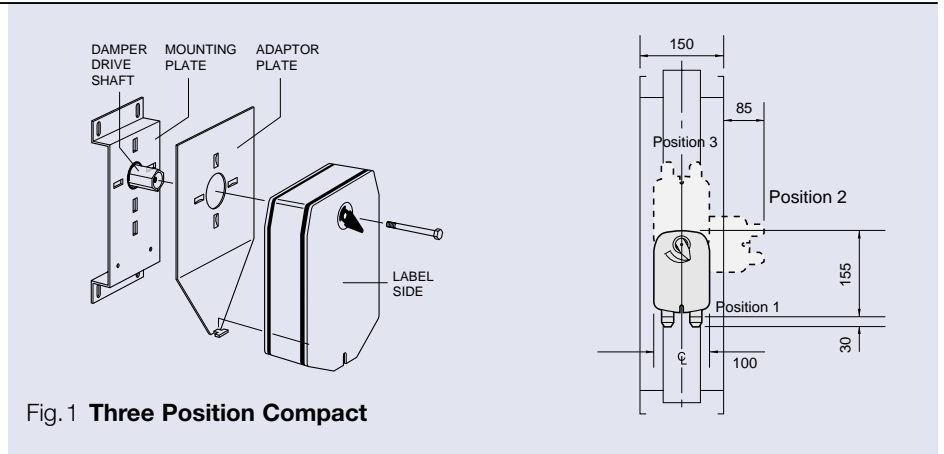


Fig.1 Three Position Compact

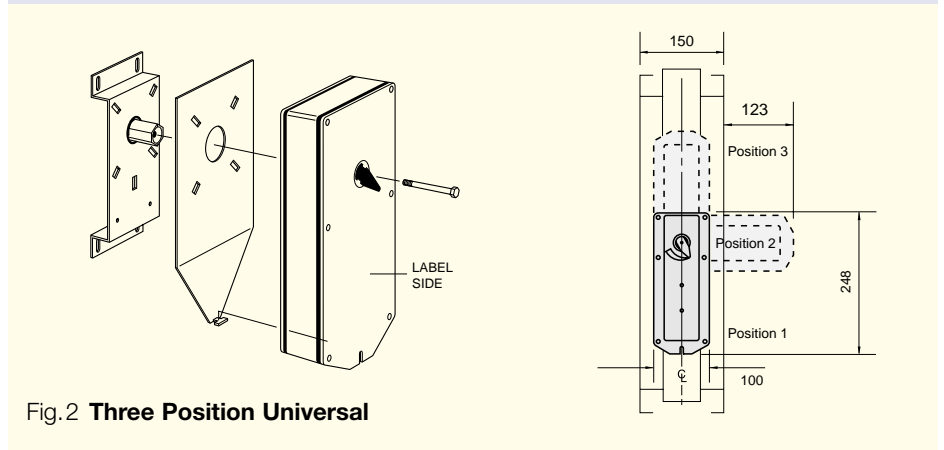


Fig.2 Three Position Universal

Control Mode Standard Parameters

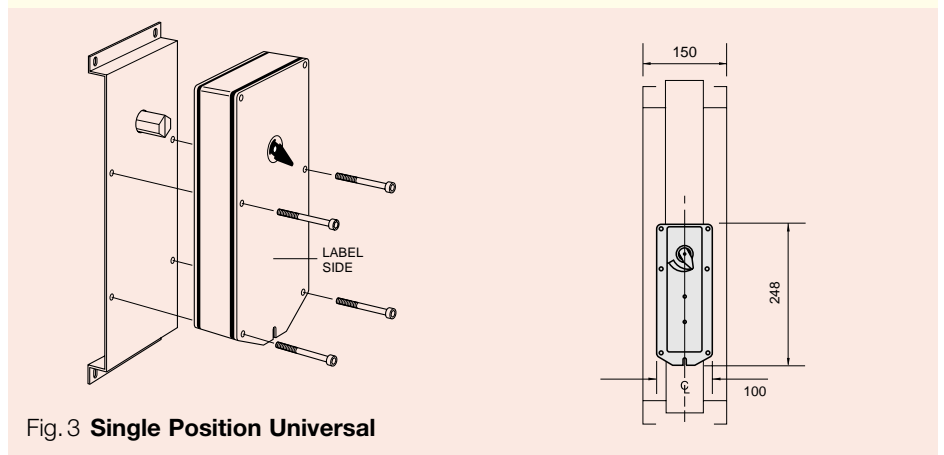
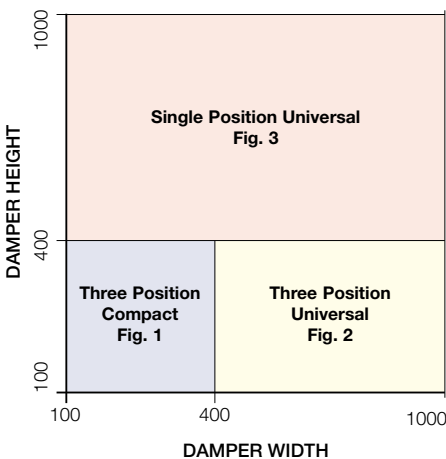


Fig.3 Single Position Universal

Application and Wiring

- Control Mode 5** 24V A.C. or D.C.
- Control Mode 6** 230V A.C. 50/60Hz
- Control Mode 120** 120V A.C. 50/60Hz

- Power On – Damper motors open.
- Power Off – Damper springs closed.
- ETR Operates – Damper springs closed.

- Release Time ≈ 20 seconds.
- Reset Time ≈ less than 60 seconds.

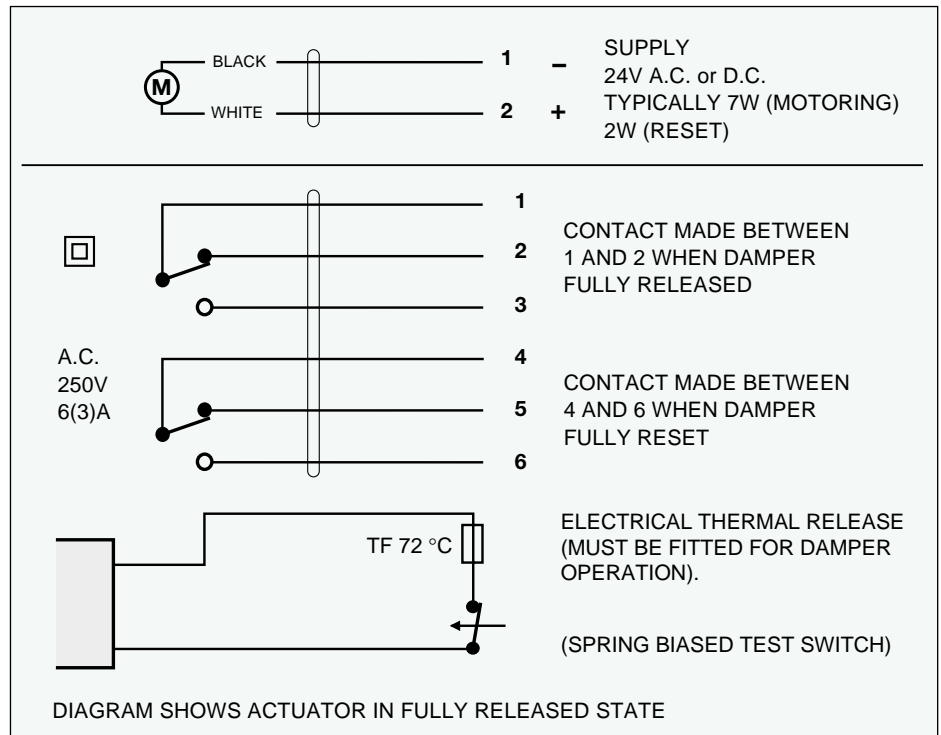
- 8W (Maximum Motoring)
- 3W (Maximum Reset).

End Switches Rated at 250V 1.5 Amp (Maximum).

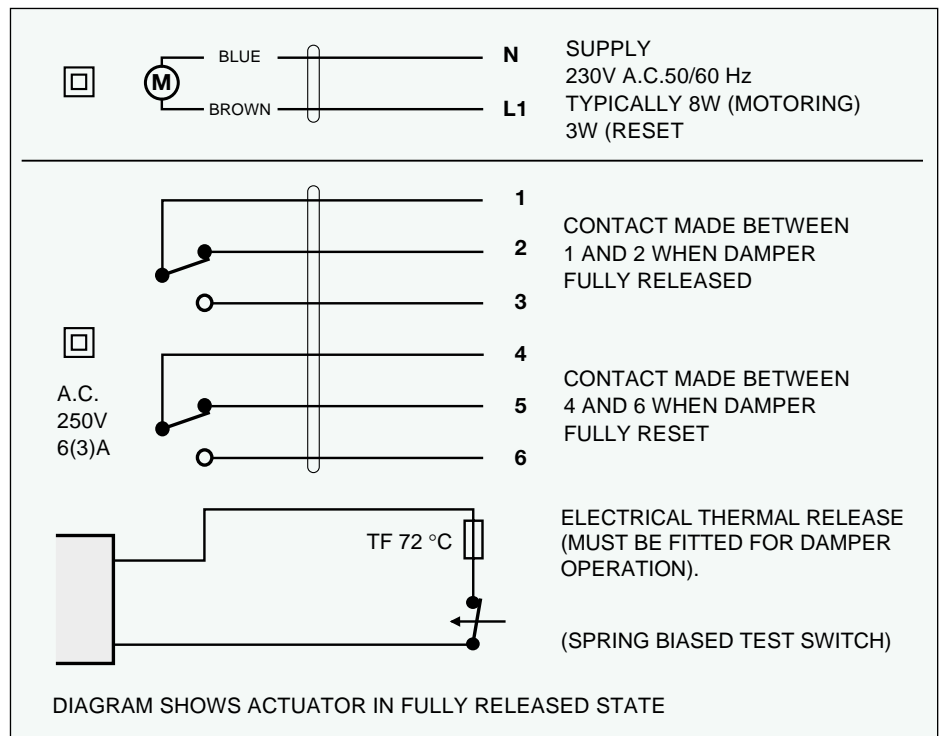
To isolate from main power supply, the system must incorporate a device, which disconnects the phase conductors, with at least 3mm contact gap.

2 x 1 metre of halogen free, low smoke and fume electric cables are included with each control mode. The ETR is also pre-wired with 0.5 metre halogen free low smoke and fume cable.

Mode 5 24V System



Mode 6 230V System



Pneumatic Operation

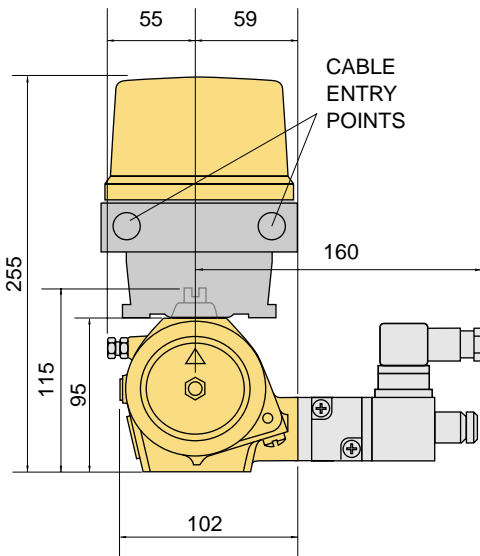
- Air On – Damper opens.
- Air Off – Spring closure.
- Release time ≈ 2 – 4 secs.
- Reset time ≈ 2 – 4 secs.
- Air inlet – 6mm dia. quick fit coupling.
- 74 °C Pneumatic Thermal Release (PTR).

- Air consumption to reset @ 5.5 bar – 535cc.
- External mechanical position indicator.
- Test operation by removing fusible link element.

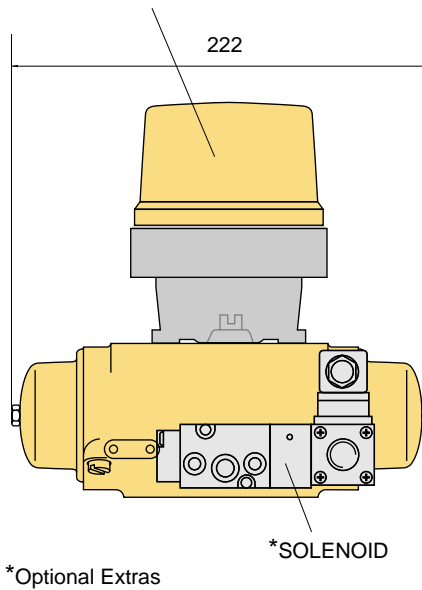
All dimension are in millimetres

Dimensional Data

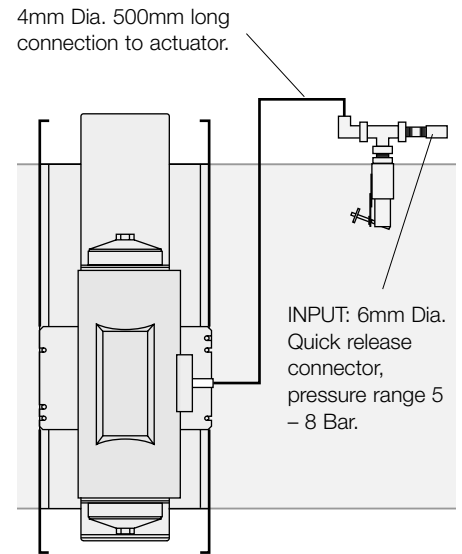
Pneumatic Spring Return Actuator



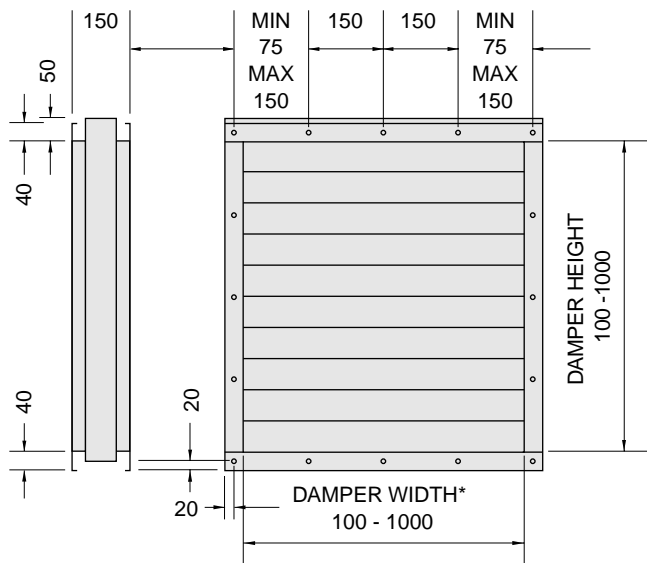
*SWITCHBOX / STATUS BEACON



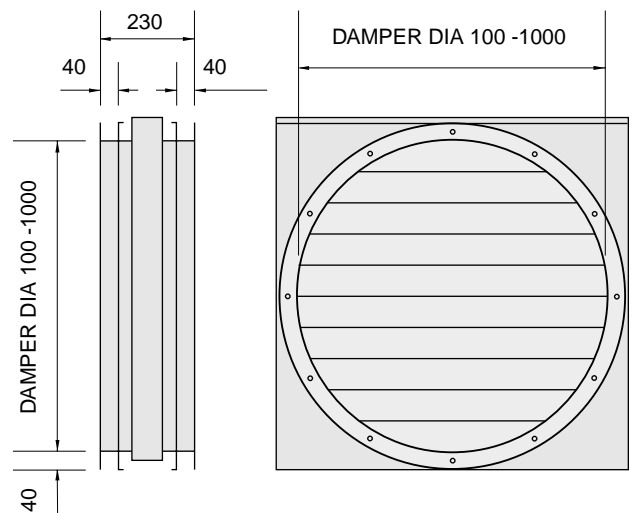
Pneumatic Thermal Release (PTR)



Square and Rectangular (A-60 RECT)



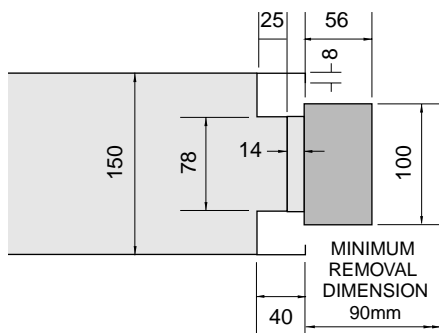
Circular (A-60 CIRC)



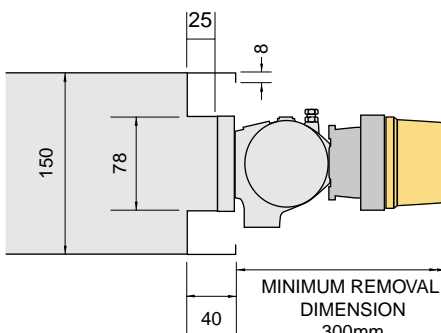
Circular Damper Fixing Hole Details

Damper Dia.	No. of Holes	Hole Dia.
100 - 250	4 off	7.0
251 - 500	8 off	10.0
501 - 750	12 off	12.0
751 - 1000	16 off	12.0

Electrical Actuator

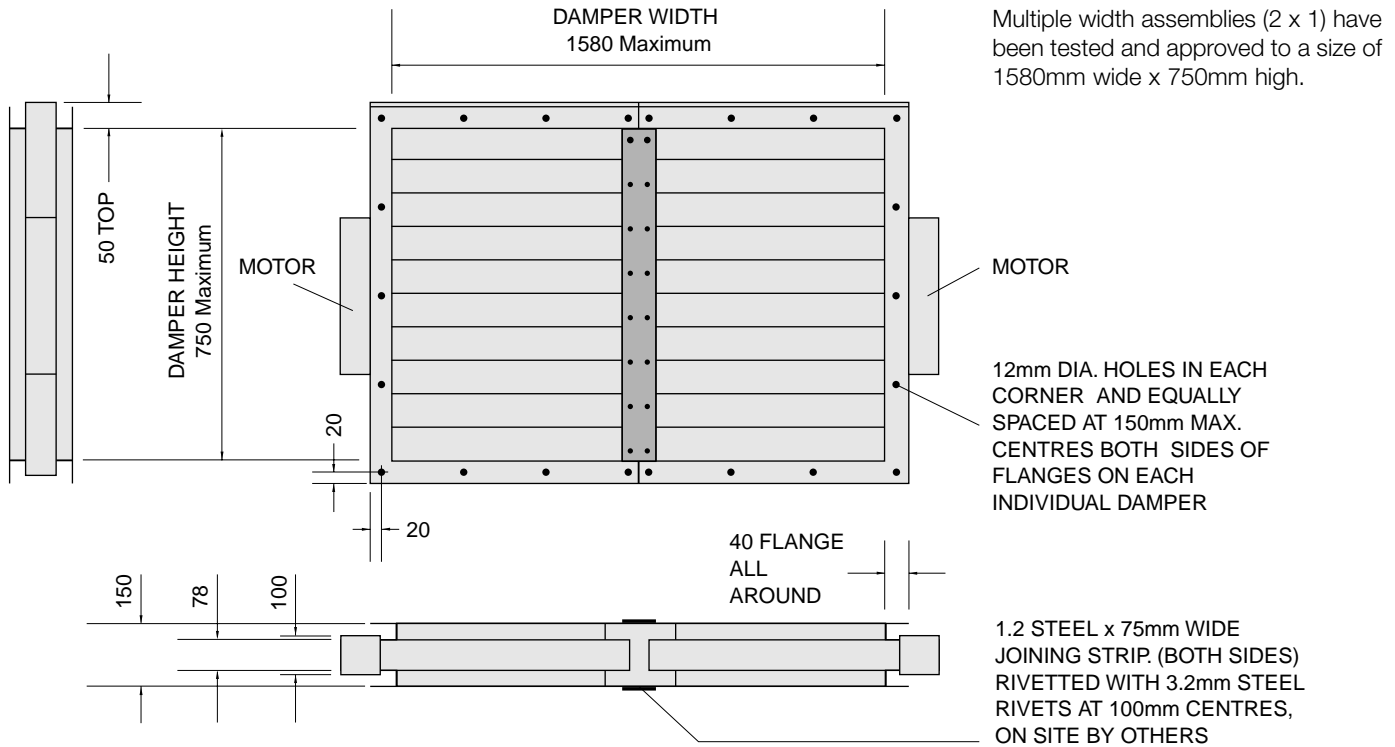


Pneumatic Actuator



PLAN VIEW CROSS SECTION SHOWING CONTROL MODE DIMENSIONS

Multiple Assemblies



Weights

Calculated Weights (Kg) of A-60 Rectangular (Excluding Actuator)

	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
100	3.8	4.2	4.6	5.1	5.5	6.0	6.4	6.9	7.4	7.8	8.3	8.7	9.2	9.6	10.1	10.5	11.0	11.5	11.9
150	4.1	4.5	4.9	5.3	5.8	6.3	6.7	7.2	7.6	8.1	8.5	9.0	9.4	9.9	10.4	10.8	11.3	11.7	12.2
200	4.4	4.8	5.2	5.6	6.1	6.5	7.0	7.4	7.9	8.4	8.8	9.3	9.7	10.2	10.6	11.1	11.5	12.0	12.5
250	5.0	5.4	5.8	6.3	6.8	7.3	7.8	8.3	8.7	9.2	9.7	10.2	10.7	11.2	11.7	12.2	12.7	13.2	13.7
300	5.7	6.1	6.5	7.0	7.5	8.1	8.6	9.1	9.6	10.2	10.7	11.2	11.8	12.3	12.8	13.3	13.9	14.4	14.9
350	6.0	6.4	6.7	7.3	7.8	8.3	8.9	9.4	9.9	10.4	11.0	11.5	12.0	12.6	13.1	13.6	14.1	14.7	15.2
400	6.6	7.0	7.4	8.0	8.6	9.1	9.7	10.2	10.8	11.4	11.9	12.5	13.1	13.6	14.2	14.8	15.3	15.9	16.5
450	7.3	7.7	8.1	8.7	9.3	9.9	10.5	11.1	11.7	12.3	12.9	13.5	14.1	14.7	15.3	15.9	16.5	17.1	17.7
500	7.6	8.0	8.4	9.0	9.6	10.2	10.8	11.4	12.0	12.6	13.2	13.8	14.4	15.0	15.6	16.2	16.8	17.4	18.0
550	8.2	8.6	9.0	9.7	10.3	11.0	11.6	12.2	12.9	13.5	14.2	14.8	15.4	16.1	16.7	17.4	18.0	18.6	19.3
600	8.9	9.3	9.7	10.4	11.1	11.8	12.4	13.1	13.8	14.5	15.1	15.8	16.5	17.2	17.8	18.5	19.2	19.9	20.5
650	9.2	9.6	10.0	10.7	11.3	12.0	12.7	13.4	14.0	14.7	15.4	16.1	16.7	17.4	18.1	18.8	19.4	20.1	20.8
700	9.9	10.3	10.7	11.4	12.1	12.8	13.5	14.2	14.9	15.7	16.4	17.1	17.8	18.5	19.2	19.9	20.6	21.4	22.1
750	10.5	10.9	11.4	12.1	12.8	13.6	14.3	15.1	15.8	16.6	17.3	18.1	18.8	19.6	20.3	21.1	21.8	22.6	23.3
800	10.8	11.2	11.6	12.4	13.1	13.9	14.6	15.4	16.1	16.9	17.6	18.4	19.1	19.9	20.6	21.4	22.1	22.8	23.6
850	11.5	11.9	12.3	13.1	13.9	14.7	15.4	16.2	17.0	17.8	18.6	19.4	20.1	20.9	21.7	22.5	23.3	24.1	24.9
900	12.2	12.6	13.0	13.8	14.6	15.4	16.3	17.1	17.9	18.7	19.6	20.4	21.2	22.0	22.8	23.7	24.5	25.3	26.1
950	12.4	12.8	13.2	14.1	14.9	15.7	16.5	17.4	18.2	19.0	19.8	20.6	21.5	22.3	23.1	23.9	24.7	25.6	26.4
1000	13.1	13.5	13.9	14.8	15.6	16.5	17.4	18.2	19.1	19.9	20.8	21.6	22.5	23.4	24.2	25.1	25.9	26.8	27.7

Calculated Weights (Kg) of A-60 Circular (Excluding Actuator)

100 Dia.	5.2
150 Dia.	6.4
200 Dia.	7.6
250 Dia.	9.4
300 Dia.	11.2
350 Dia.	12.7
400 Dia.	14.7
450 Dia.	16.9
500 Dia.	18.5
550 Dia.	20.8
600 Dia.	23.2
650 Dia.	24.9
700 Dia.	27.5
750 Dia.	30.2
800 Dia.	32.1
850 Dia.	34.9
900 Dia.	37.8
950 Dia.	39.9
1000 Dia.	43.0

Compact Including Adaptor Plate 1.85kg
Universal Including Adaptor Plate 3.00kg

Pneumatic Including Adaptor Plate 3.00kg

Acoustic Data

The data presented is from the Laboratory Determination of Acoustic and Aerodynamic Performance of A-60 Marine Fire Dampers.

A programme of extensive tests was carried out by an independent test facility, approved under the NAMAS Scheme, in accordance with BRITISH STANDARDS Nos. 4196, 4773, 4856, 4857 and 4954.

From the selection of a duct velocity within the operational parameters of the damper a resultant pressure drop from Table 1 can be determined and the sum of these two components applied to the Velocity x Pressure Drop Vs Sound Power Level Graph. (Table 2).

The graph is the result of a full range of acoustic tests with the blades set in the fully open position.

The Spectrum Correction Data is applied to the number obtained from the graph and a complete Sound Spectrum of Flow Generated Noise for both Outlet (in duct) and Breakout (casing radiated) is obtained.

Example:



Duct with a design velocity of 8 m/sec and the A-60 Marine Fire Damper RECT damper blades in the fully open position.

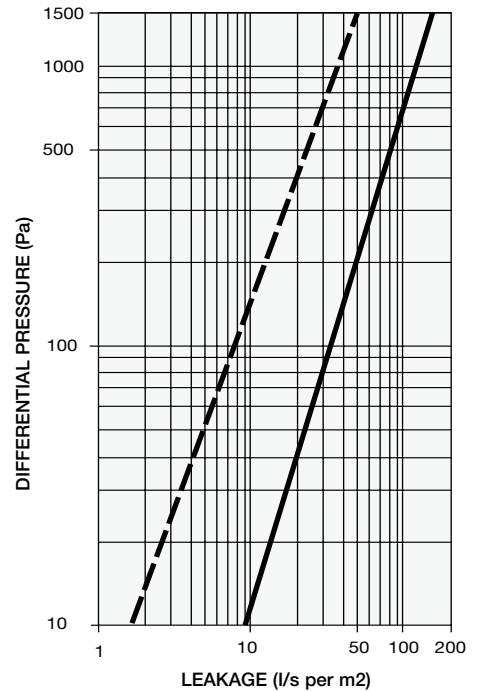
Pressure Drop = 22 Pa (Table 1).
 Multiply Velocity x Pressure Drop
 $8 \times 22 = 176$.

From Sound Power Graph (Table 2) plot 176 on horizontal Velocity/Pressure axis against the A-60 Marine Fire Damper RECT outlet (induct) graph to obtain 47 dBW on Vertical Sound Power Level Axis. Add or subtract corrections to the 47dBW to provide full spectrum analysis.

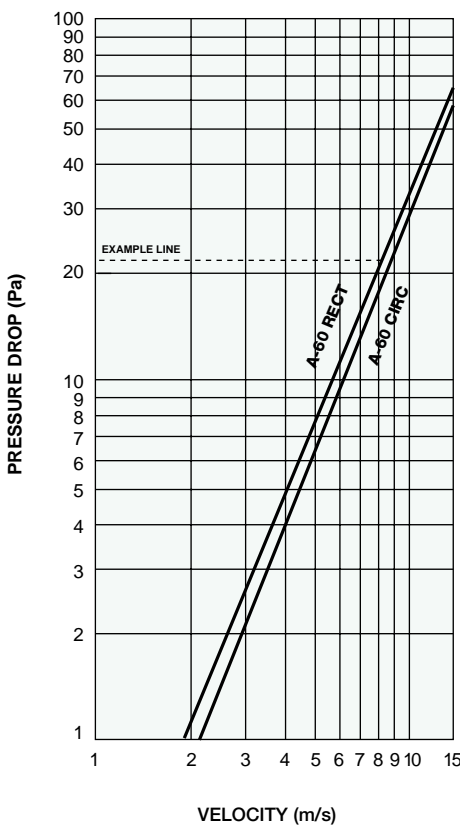
Damper Leakage Table 3

A-60 Marine Fire Damper damper closed blade leakage.

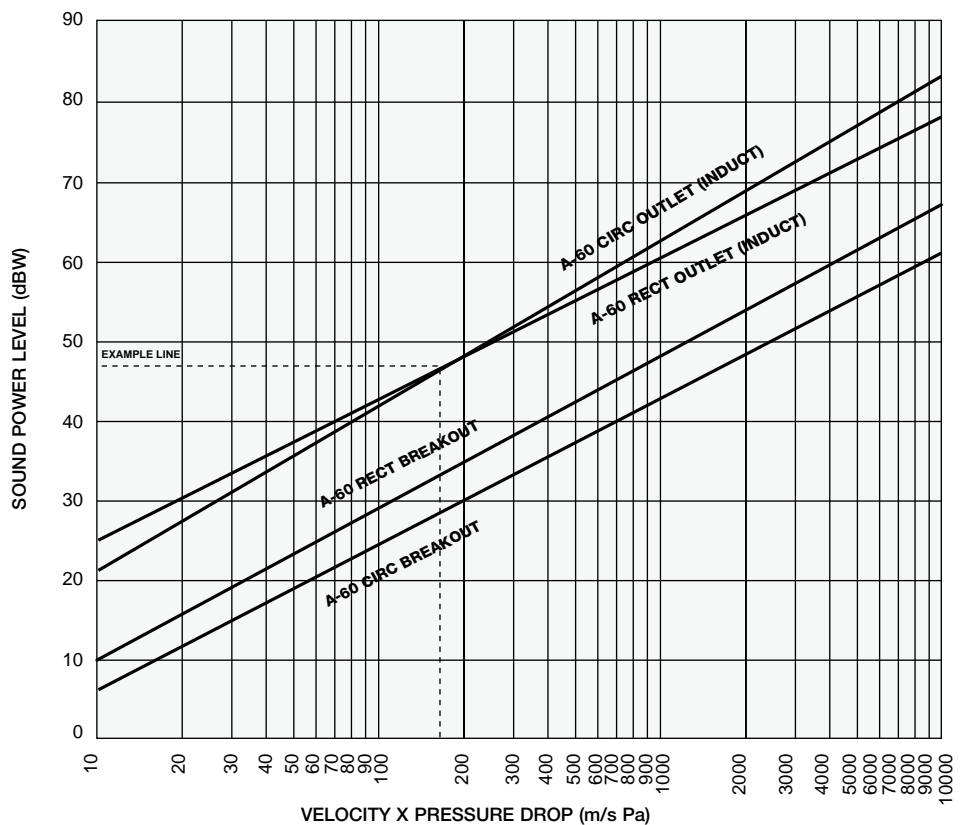
Standard (without blade seals) 
Optional (with blade seals) 



Pressure Drop Vs Velocity Table 1



Velocity (m/s) X Pressure Drop (Pa) Vs Sound Power Level (dBW) Table 2



Outlet (Induct) Spectrum Corrections

Octave Band	63	125	250	500	1k	2k	4k	8k
A-60 RECT	5	4	5	5	3	1	-3	-5
A-60 CIRC	9	4	4	5	3	1	-3	-6

Breakout Spectrum Corrections

63	125	250	500	1k	2k	4k	8k	Hz
8	11	9	6	-3	-6	-14	-17	dB
6	10	8	4	-3	-3	-11	-14	dB

Certification



USCG-EU EC Type Examination (Module B)



USCG - EU (Module D) Certificate of Conformity

Germanischer Lloyd Approval Certificate

For a live update
<http://www.gli-group.com/newbuilding/approvals/cert/4331602.pdf>

Certification



SAS F040322 Lloyds Registered Certificate of Fire Approval



ABS Approval Certificate

Standard Ordering Procedure

Please Specify

Series

A-60 RECT (Galv) A-60 Marine Fire Damper 430 Ferritic Stainless Steel Blades. Square or Rectangular Flanges. Galvanised Casing.	A-60 CIRC (Galv) A-60 Marine Fire Damper 430 Ferritic Stainless Steel Blades. Circular Flanged . Galvanised Casing.	A-60 RECT (316) A-60 Marine Fire Damper 316 Austenitic Stainless Steel Blades. Square or Rectangular Flanges. Stainless Steel Casing.	A-60 CIRC (316) A-60 Marine Fire Damper 316 Austenitic Stainless Steel Blades. Circular Flanged. Stainless Steel Casing.
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Control Modes

Control Mode 5	24V A.C. or D.C.
Control Mode 6	230V A.C. 50/60Hz
Control Mode 120	120V A.C. 50/60Hz
Pneumatic	5 - 8 Bar Air Supply

Seals





Standard	(without blade seals)
Optional	(with blade seals)

Flange Holes

Drilled	(Standard)
Undrilled	(Optional)

Accessories (Electrical)

A range of indicator panels, push button switches and damper test units are also available. The housing for these units are manufactured in rigid ABS plastic. The Damper Connection Box is in galvanised steel.

	Damper Test Unit Reset and release indication. Spring bias (power OFF) test switch. Power normally ON.	DTU24	24V AC/DC	XNNN00010
		DTU120	120V AC	XNNN00305
		DTU230	230V AC	DNNN00029
	Damper Status Indicator Reset and release indication.	DSI24	24V AC/DC	DPNN00412
		DSI120	120V AC	XNNN00308
		DSI230	230V AC	DPNN00413
	Damper Control Unit Switch ON/OFF function. Reset and release indication.	DCU24	24V AC/DC	XNNN00309
		DCU120	120V AC	XNNN00310
		DCU230	230V AC	XNNN00311
	Damper Connection Box	DCB24	24V AC/DC	XNNN00312
		DCB230	230V AC	XNNN00325

Accessories (Pneumatic)

Solenoid, (24, 120, or 230 volt). Switchbox (Status Beacon).

Example	3	/	A-60 RECT (Galv)	/	400 (W) x 250 (H)	/	M5	/	Standard Undrilled	/	DCU
	Quantity		Series		Duct size		Control Modes		Options		Accessories



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Part of Ruskin Air Management Limited

Quality System Assessed to ISO 9001: 2000



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