

Actionair Control and Shut Off Dampers

Air/Shield Aerofoil Air Control Dampers

Air/Shield Aerofoil Air Control and Shut-Off Dampers

Energy/Shield ES35 Air Control Dampers

Energy/Shield ES36 Air Control and Shut-Off Dampers

Air/Shield Features and Design Guide

- Opposed blade dampers suitable for systems requiring air control (Aerofoil) and low closed blade leakage (Aerofoil).
- Suitable for low/medium pressure and velocity systems.
- Available in flanged type casing up to 1000mm square or spigotted type casings up to 1000mm square / 1000mm diameter or flat oval up to 1000mm x 500mm in a single drive arrangement.

ES35 and ES36 Features and Design Guide

- Opposed Blade (standard) or Parallel Blade (optional) dampers suitable for systems requiring air control (ES35) and low closed blade leakage (ES36).
- Suitable for low / medium pressure and velocity systems.
- Available in flanged type casing (up to 2080mm x 1000mm in a single drive arrangement).



Introduction

Actionair has announced a major enhancement to the company's well-proven Air/Shield range of opposed blade dampers.

To maximise the potential number of single-module / single-drive configurations, the range has been complemented by the addition of Energy/Shield Dampers for ductwork applications above 1000mm in width.

Thus, Energy/Shield ES35 units can now be selected for air balancing requirements for flanged ductwork above 1000mm X 1000mm. Shut off damper requirements for ductwork in these sizes can be met by Energy/Shield ES36 models, where a single drive is required. Smaller sizes are also available in a flanged style casing.

For ductwork in sizes below these dimensions the range of Air/Shield Aerofoil (air balancing) and Aeroseal (shut off) Dampers will continue to provide a quality engineered solution.

Maximum versatility

To ensure maximum versatility of application flanged Energy/Shield ES35 and ES 36 units will be available in 1mm height increments, while specifiers may opt for either opposed blade or parallel blade action according to requirement.

For ducts up to 2080mm in width x 1000mm in height these new flanged models can be powered by a single drive to minimise unit cost and maintenance requirements. Blade drive mechanisms are mounted out of the air stream to minimise pressure drop and noise generation.

The entire combined range of Air/Shield Aerofoil, Aeroseal and Energy/Shield ES35 and ES36 models is suitable for use with total system operating pressures up to 1000 Pa and velocities up to 12m/s. Casing leakage conforms to DW144 Class C up to 1000 Pa.

Product Sizing



Aerofoil Air Control Damper



Aeroseal Air Control and Shut-Off Damper



ES35 Air Control Damper



ES36 Air Control and Shut-Off Damper

Air/Shield Aerofoil and Aeroseal FLA (single drive arrangement)

Widths from 100mm minimum – 1000mm maximum, (in 1mm increments).

Heights from 100mm minimum – 1000mm maximum, (in 50mm increments).

Air/Shield Aerofoil and Aeroseal SPG (single drive arrangement)

Widths from 100mm minimum - 1000mm maximum, (in 1mm increments).

Heights from 100mm minimum – 1000mm maximum, (in 1mm increments).

Air/Shield Aerofoil and Aeroseal Circular (single drive arrangement)

Diameters from 100mm minimum – 1000mm maximum (in 1mm increments).

Air/Shield Aerofoil and Aeroseal Flat Oval (single drive arrangement)

Widths from 300mm minimum – 1000mm maximum, (in 1mm increments).

Heights from 100mm minimum – 500mm maximum, (in 1mm increments).

Energy/Shield ES35 and ES36 FLA (single drive arrangement)

Widths from 200mm minimum – 2080mm maximum, (in 1mm increments).

Heights from 200mm minimum – 1000mm maximum, (in 1mm increments).

Dampers from 1201mm minimum - 2080mm maximum in width will be supplied with a mullion (80mm wide), factory fitted joining strip and hexagonal couplings. This single drive arrangement is supplied as a complete unit.

Air/Shield

The Range

The Air/Shield range of quality engineered dampers are suitable for air conditioning and ventilation systems requiring air control and low closed blade leakage characteristics, for standard low/medium pressure and velocity systems.

These aerodynamic precise movement opposed blade dampers can be either factory fitted with manual, electric or pneumatic

controls and can be supplied in a flanged or spigotted casing.

Application Parameters

Air/Shield Dampers to maximum width and height dimensions (see page 5) can be used where the operating total system pressure is up to 1000 Pascals and duct velocities to 12m/second.

Actionair Air/Shield Dampers are designed for applications in normal

dry filtered air systems. When required for modulating function, or if exposed to fresh air intakes and/or inclement conditions, the dampers should be subject to a planned inspection programme.

Any application involving corrosive and/or aggressive hostile environmental conditions (e.g. swimming pools) may invalidate our warranty and should be referred to Actionair Sales Office.

Blade Features



Series Aerofoil

Series Aerofoil for system air balancing having aerodynamic ribbed double skin type 1.4016 (430) Ferritic Stainless Steel 50mm wide x 0.4mm thick blades. Housed within a galvanised mild steel flanged or galvanised spigotted casing being suitable for systems with a temperature range of -20°C through to $+70^{\circ}\text{C}$.

Optional Blade construction type 1.4401 (316) Austenitic Stainless Steel.



Series Aero Seal

Series Aero Seal for system air balancing and shut-off having aerodynamic double skin type 1.4016 (430) Ferritic Stainless Steel 50mm wide x 0.4mm thick blades with synthetic trailing edge blade seals and Stainless Steel side seals. Housed within a galvanised mild steel flanged or galvanised spigotted casing being suitable for systems with a temperature range of 0°C through to $+70^{\circ}\text{C}$.

Optional Blade construction type 1.4401 (316) Austenitic Stainless Steel.

Blade Drive Mechanism

The totally enclosed, precise movement, opposed blade cap and bar drive mechanism positioned out

of the airstream for protection against damage is hard wearing and free running.

Casing Features

The damper casing having a single penetration for the drive control shaft making these dampers suitable for inclusion into air distribution systems of Class A and B of Eurovent Document 2/2 and Test Procedures for Classes A, B, and C (up to 1000 Pa) of HVCA Ductwork Specification DW144.

Flanged

A 1.5mm thick galvanised mild steel casing having peripheral flanges with pre-punched elongated corner holes to suit proprietary duct flanges.

Stainless Steel Options

See Dimensional Data and refer to Actionair Sales Office.

Spigotted

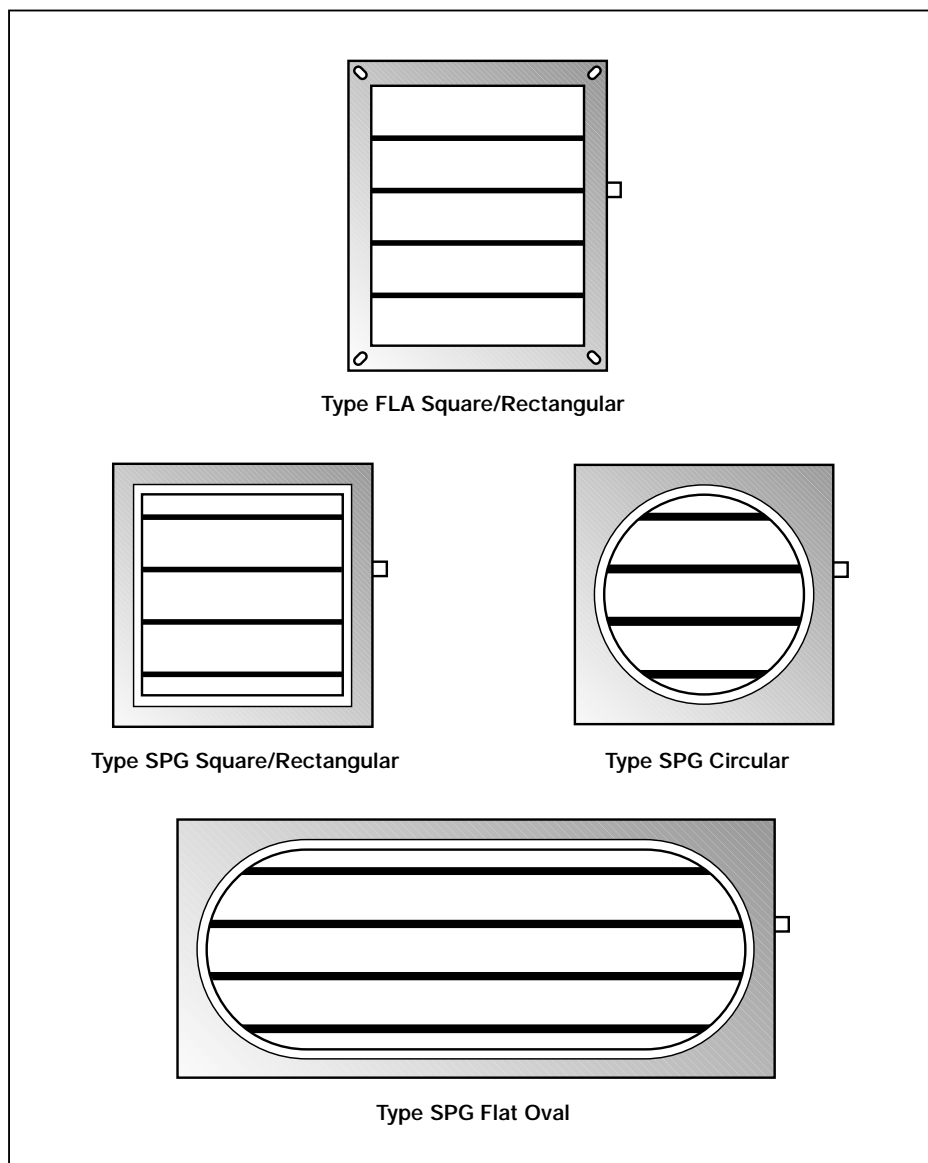
Consists of Flanged Casing above with 0.9mm minimum thickness spigots on both sides.

Stainless Steel Options

See Dimensional Data and refer to Actionair Sales Office.

Please note: Air/Shield Aerofoil and Aerofoil dampers are only available in widths up to 1000mm, please refer to page 5 for full sizing parameters.

Where applications involving flanged style dampers requiring widths greater than 1000mm please refer to page 8 which details the ES35 and ES36 flange damper solutions.



Weights

Air/Shield Aerofoil and Aerofoil Approximate Weights (Kg)

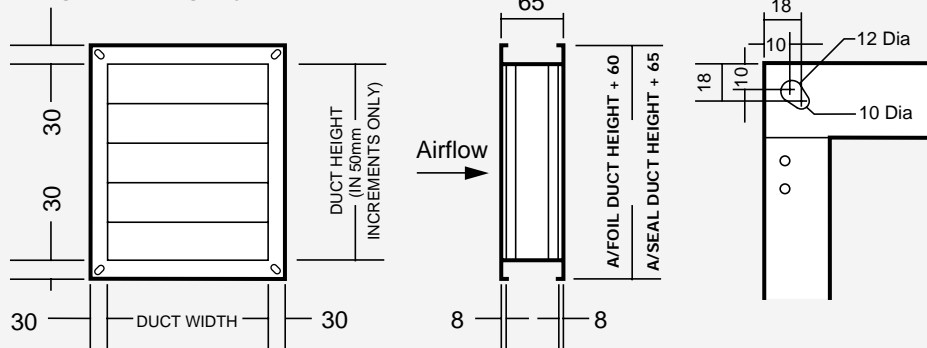
SQUARE/ CIRCULAR DUCT SIZE (mm)	TYPE FLA RECTANGULAR	TYPE SPG RECTANGULAR	TYPE SPG CIRCULAR
100	1.5	1.8	2.1
150	2.0	2.4	2.9
200	2.5	3.1	3.8
250	3.1	3.8	4.7
300	3.8	4.6	5.8
350	4.5	5.4	6.9
400	5.2	6.3	8.0
450	5.8	7.0	9.0
500	6.6	7.9	10.3
550	7.5	9.0	11.6
600	8.4	10.0	13.0
650	9.3	11.0	14.4
700	10.0	11.9	15.7
750	11.3	13.3	17.5
800	12.4	14.5	19.2
850	13.3	15.6	20.7
900	14.7	17.1	22.7
950	15.7	18.2	24.3
1000	16.8	19.4	26.1

For Type SPG Flat Oval weights please contact Actionair Sales Office.

Please note: Aerofoil and Aerofoil dampers must not be installed with blades running vertical.

Dimensions

Flanged Casing (Type FLA)



Sizing Parameters

Type FLA

Widths from 100 – 1000mm in 1mm increments.
Heights from 100 – 1000mm in 50mm increments.

Type SPG Rectangular

Widths from 100 – 1000mm in 1mm increments.
Heights from 100 – 1000mm in 1mm increments.

Type SPG Circular

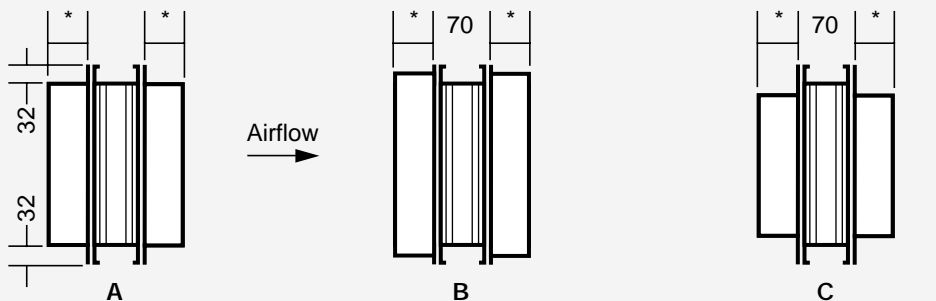
Diameters from 100 – 1000mm in 1mm increments.

Type SPG Flat Oval

Widths from 300 – 1000mm in 1mm increments.
Heights from 100 – 500mm in 1mm increments.

Spigot Casing (Type SPG Rectangular, Circular and Flat Oval)

SPG Rectangular spigots are supplied 5mm under duct size, Circular and Flat Oval 3mm under duct size.



A = Standard 50mm height increments

B = up to 10mm above 50mm height increments

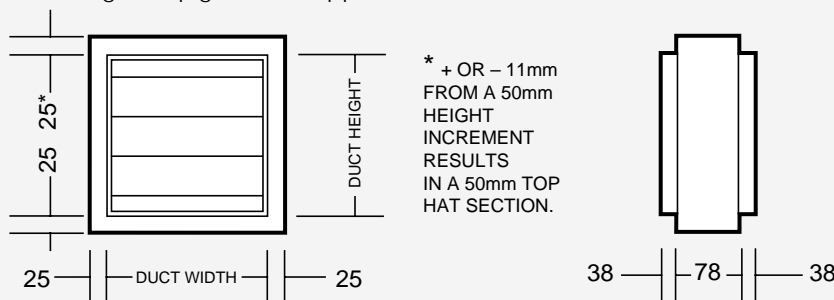
C = All other cases

* = 38mm Rectangular, 65mm Circular and Flat Oval

Stainless Steel Options

Spigot Casing (Type SPG Rectangular)

SPG Rectangular spigots are supplied 5mm under duct size.



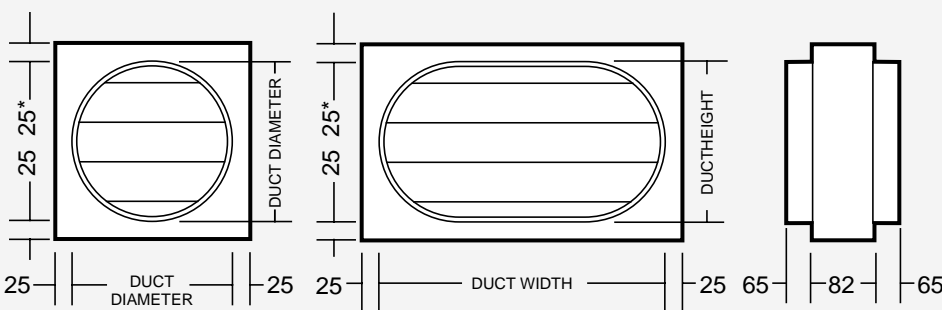
Size Parameters as above.

Stainless Steel Type FLA

Damper casings will have a depth of 150mm with 40mm peripheral flanges (Please refer to Actionair Sales Office).

Spigot Casing (Type SPG Circular and Flat Oval)

SPG Circular and Flat Oval spigots are supplied 3mm under duct size.



* + OR - 11mm FROM A 50mm HEIGHT INCREMENT RESULTS IN A 50mm TOP HAT SECTION.

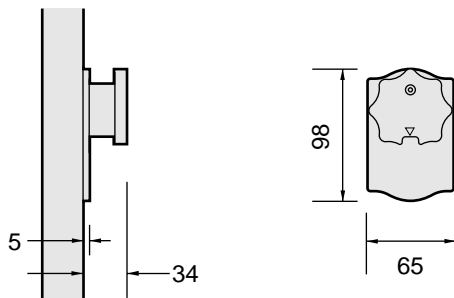
Control Options

Manual Control (Option M)

Always fitted as standard on Series Aerofoil units. Not suitable for Series Aerofoil or any Stainless Steel options.

Type
FLA/SPG

Consists of a red knob and slimline control box with blade position locking facility (a no. 6 pk screw supplied and fitted by others pierces through membrane in the control box) and visual blade position indication.

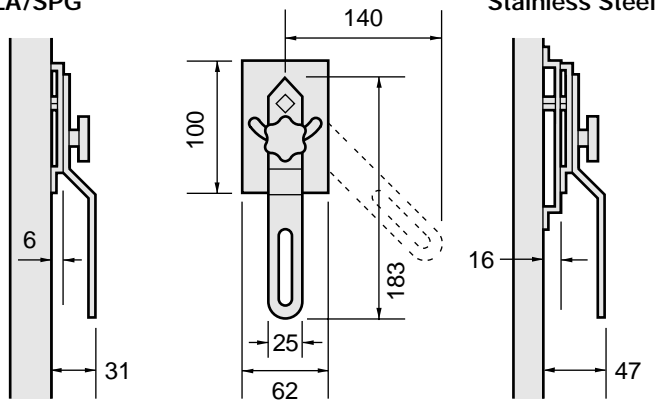


Manual Quadrant Control (Option Q)

Always fitted as standard on Series Aerofoil and also on all Stainless Steel options.

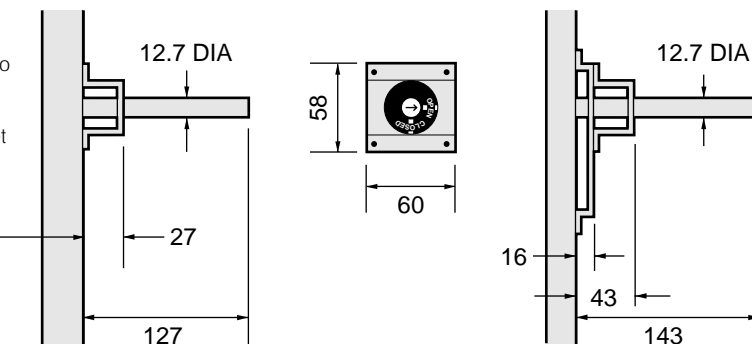
Type
FLA/SPG

Consists of a dark brown steel handle, blade position locking facility and quadrant bracket with visual position indication.



Extended Shaft Control (Option X)

A solid 12.7mm diameter stainless steel shaft marked to provide visual blade indication complete with support bracket for attachment of couplings and/or linkages for motorisation by others. (Shaft rotates clockwise to close damper).



Electrical Controls (Option E)

Factory fitted Belimo Actuators for 24V or 230V open/closed or spring return operation and 24V modulating are available. These will comply with EMC Directive 89/336/EEC.

Pneumatic Controls

Factory fitted Hytrk Pneumatic Actuators are available in on/off and spring return versions.

Technical Data

Damper Torque

The rotation of damper blades from the fully closed to the fully open position produces the greatest torque. The largest torque is also dependent on the fan and system characteristics.

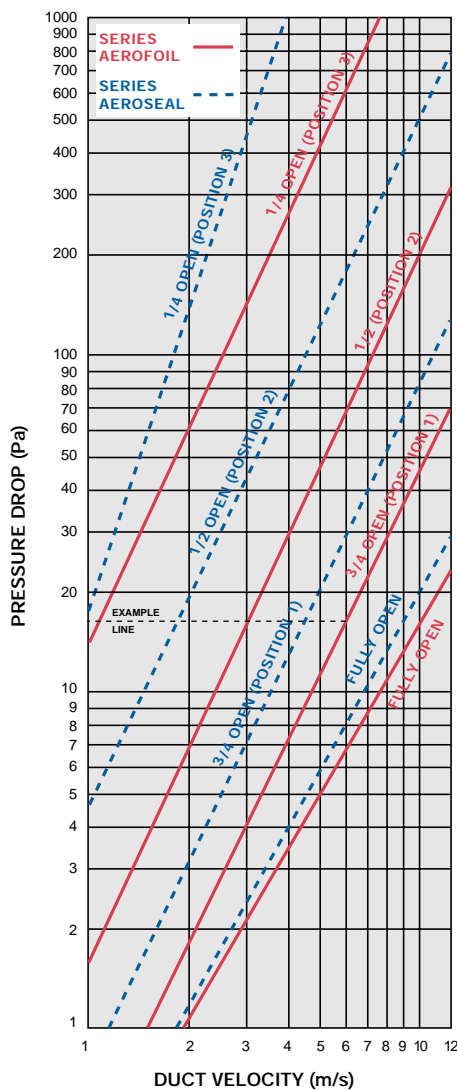
Series Aerofoil dampers to the maximum size of 1000mm wide x 1000mm high or 1000mm diameter generally require no more than 10Nm torque.

Series Aerofoil dampers to the maximum size of 1000mm wide x 1000mm high or 1000mm diameter require no more than 18Nm torque.

The above torques are to rotate the damper from the fully closed to the fully open position against the recommended maximum total system pressure of 1000 pascals and the maximum duct velocity of 12m/s.

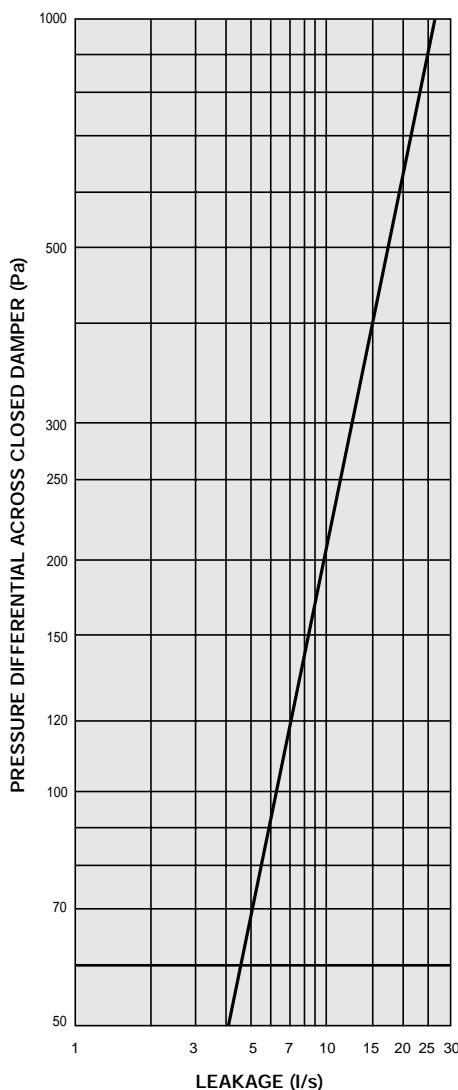
Pressure Drop Vs Velocity

Positions 1, 2 and 3 are blade positions as indicated on dampers fitted with Manual Control or Manual Quadrant Control.



Damper Leakage

Air/Shield Series Aerofoil closed blade leakage 1000mm wide x 1000mm high Damper.



Air/Shield Aerofoil

Air control and system balancing shut-off dampers comprising of 50mm stainless steel aerodynamic blades with synthetic trailing edge blade seals, synthetic blade end bearings and stainless steel top and side spring tempered flexible gasketing.

Dampers to have a maximum closed blade leakage of 27 l/s at 1000 Pa when measured on a 1000mm wide x 1000mm high damper.

Housed in either a galvanised mild steel frame having integral peripheral flanges, with prepunched corner holes to suit proprietary duct flanges (Type FLA) or with spigot plates on both sides, for square, rectangular, circular or flat oval connections (Type SPG).

The totally enclosed precise movement opposed blade drive mechanism positioned out of the airstream for protection against damage is hard wearing and free running.

Air/Shield Aerofoil as supplied by Actionair.

Air/Shield

Aerofoil dampers are supplied fitted as standard with type Manual Control (Option M).

Aerofoil dampers are supplied fitted as standard with type Manual Quadrant Control (Option Q).

Stainless Steel dampers are supplied with type Manual Quadrant Control (Option Q) fitted as standard.

Air/Shield dampers can be factory fitted with one of the alternative control options as detailed on page 6 (Aerofoil and Stainless Steel dampers not suitable for Option M).

Specification

Air/Shield Aerofoil

Air control and system balancing dampers comprising of 50mm ribbed stainless steel aerodynamic blades with synthetic blade end bearings.

Housed in either a galvanised mild steel frame having integral peripheral flanges, with prepunched corner holes to suit proprietary duct flanges (Type FLA) or with spigot plates on both sides, for square, rectangular,

circular or flat oval connections (Type SPG).

The totally enclosed precise movement opposed blade mechanism positioned out of the airstream for protection against damage is hard wearing and free running.

Air/Shield Aerofoil as supplied by Actionair.

Energy/Shield ES35 & ES36

The Range

The Energy/Shield ES35 & ES36 range of Flanged dampers are suitable for air conditioning and ventilation systems requiring air control and low closed blade leakage characteristics, for low / medium pressure and velocity systems. These aerodynamic precise movement opposed blade (parallel blade optional) dampers can be either fitted with manual, electric, pneumatic or extended spindle controls.

Application Parameters

Energy/Shield Flanged ES35 and ES36 to maximum width (2080mm) and height (1000mm) dimensions can be used where the operating total system pressure is up to 1000 Pa and duct velocities of 12m/s. Energy/Shield ES35 and ES36 Flanged dampers are designed for applications in normal dry filtered air systems. When required for modulating function, or if exposed to fresh air intakes and/or inclement

conditions, the dampers should be subject to a planned inspection programme. Any application involving corrosive and/or hostile environmental conditions (e.g. swimming pools) may invalidate our warranty and should be referred to Actionair Sales Office.

Blade Features

Series ES35

Series ES35 for air control having aerodynamic triple – vee 1.6mm thick x 157mm wide galvanised steel blades. Housed in a 1.2mm thick x 160mm deep galvanised steel frame with 40mm flanges, with pre-punched corner holes to suit proprietary duct flanges, suitable for systems with a temperature range of -40°C to +116°C. Please note actuators: this may exceed certain actuator temperature ranges.



Series ES36

Series ES36 are similar to that of the ES35 except having stainless steel side gasketing and synthetic blade seals, resulting in low closed blade leakage. Also the operating temperature range is -40°C to +70°C. Please note actuators: this may exceed certain actuator temperature ranges.

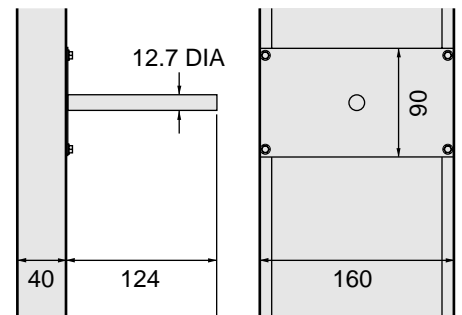


Blade Drive Mechanism

Blade Drive Mechanism is mounted out of the airstream to minimise pressure and noise generation, blade axles are 11.1mm hexagonal zinc plated steel. Synthetic blade bearings

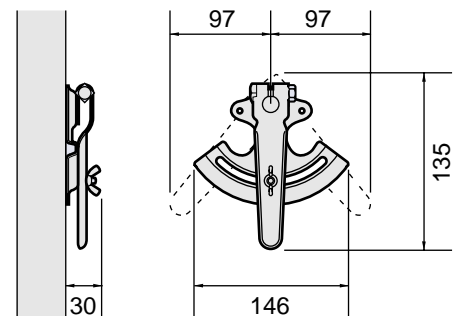
give a corrosion resistant, hard wearing and free running operation

Control Options



Extended Shaft Control (Option X)

12.7mm diameter x 150mm Zinc plated steel Extended Spindle for motorised control. Supplied as standard. Loose for site fitting by others.



Manual Quadrant Control (Option Q)

Manual Quadrant Control. Supplied loose for site fixing by others.

Electrical Controls (Option E)

Belimo Actuators for 24V or 230V open/closed or spring return operation and 24V modulating are available.

Casing Features

The flanged damper casing having a single penetration for the drive control shaft makes these dampers suitable for inclusion into air distribution systems, casing leakage conforms to DW144 Class C up to 1000 Pa. The casing consists of 1.2mm thick x 160mm deep galvanised steel frame with 40mm flanges pre-punched corner holes to suit proprietary duct flanges.

Single Drive Arrangement

Dampers with widths from 200mm - 2080mm and heights from 200mm - 1000mm will be supplied with a single drive. Dampers having a width dimension from 200mm - 1200mm will be supplied without a mullion. Dampers having width from 1201mm - 2080mm will be supplied with a single drive centre mullion, factory fitted joining strips and blade drive coupling.

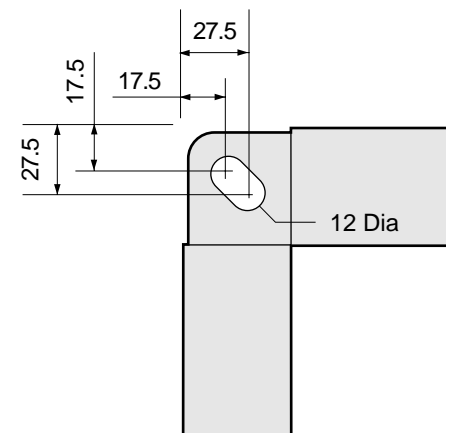
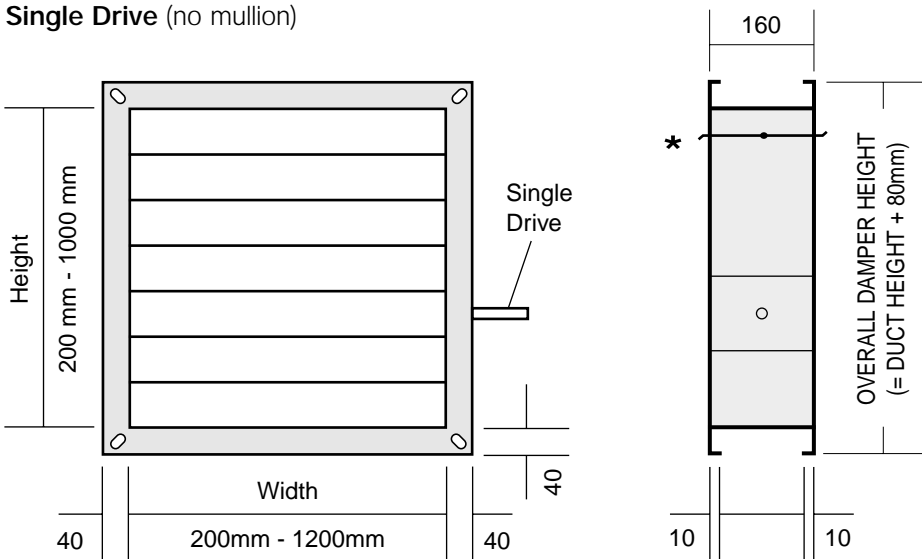
Multiple Width Configuration

These are available as two single units, up to a maximum of 4240mm wide and are driven from each side. these multiple width arrangements are supplied with joining strips (galvanised 1.2mm thick x 75mm wide) for on site fixing by others. For large assemblies additional support may be required. Please refer to Actionair Sales Office for multiple height configurations.

Please note ES35 and ES36 single or multiple dampers must not be installed with the blades running vertical.

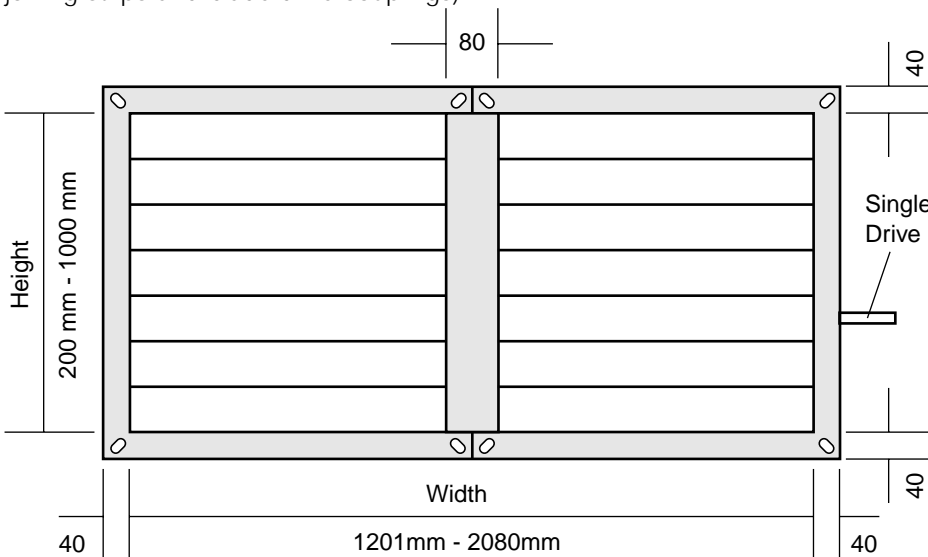
Dimensions

Single Drive (no mullion)



* Top and bottom blade when open protrude on both side sides beyond casing, see below.

Single Drive (including 80mm central mullion with, factory fitted joining strips and blade drive couplings)



Height	Overhang
200	16
225	27
375	16
525	27
650	16
675	27
800	16
950	16

Size Parameters

Available in 1mm increments

Single drive arrange

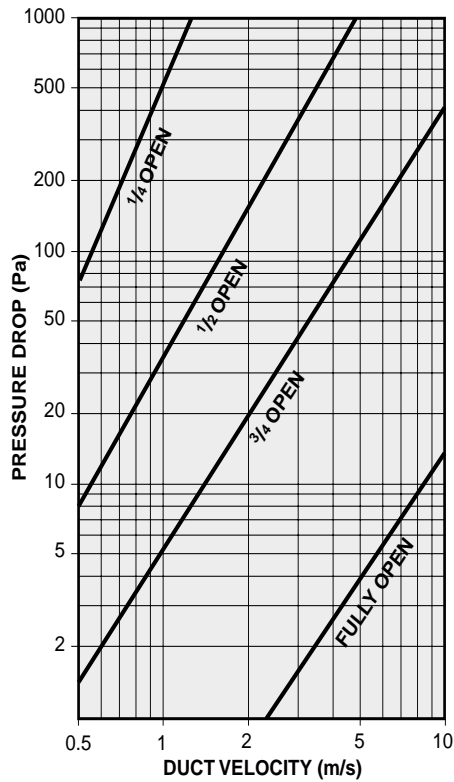
Widths from 200mm - 2080mm
Heights from 200mm - 1000mm.

Technical Data ES35 and ES36

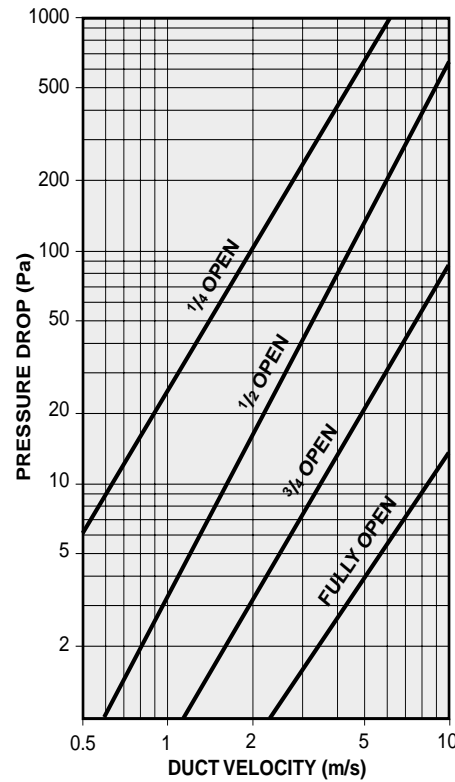
Specification

Graphs showing Pressure Drop Vs Velocity at intermediate Blade positions.

E/S. 35/R ES36R (Opposed Blade)



E/S. 35/P E/S 36/P (Parallel Blade)



Energy/Shield ES35

Air control dampers comprising of 157mm triple vee galvanised blades with synthetic blade bearings. Housed in a galvanised steel frame having integral peripheral flanges, with pre-punched corner holes to suit proprietary duct flanges. The opposed blade and parallel blade (optional) drive mechanism is mounted out of the airstream. Energy/Shield ES35 as supplied by Actionair.

Energy/Shield ES36

Air control and shut-off dampers comprising of 157mm triple vee galvanised blades with synthetic blade seals and stainless steel side gasketing. Housed in a galvanised steel frame having integral peripheral flanges, with pre-punched corner holes to suit proprietary duct flanges. The opposed blade and parallel blade (optional) drive mechanism is mounted out of the airstream. Energy/Shield ES36 are supplied by Actionair.

Damper Torques

The rotation of damper blades from fully closed to the fully open position produces the greatest torque. The largest torque is also dependent on the fan and system characteristics.

Series Energy/Shield ES35 and ES36

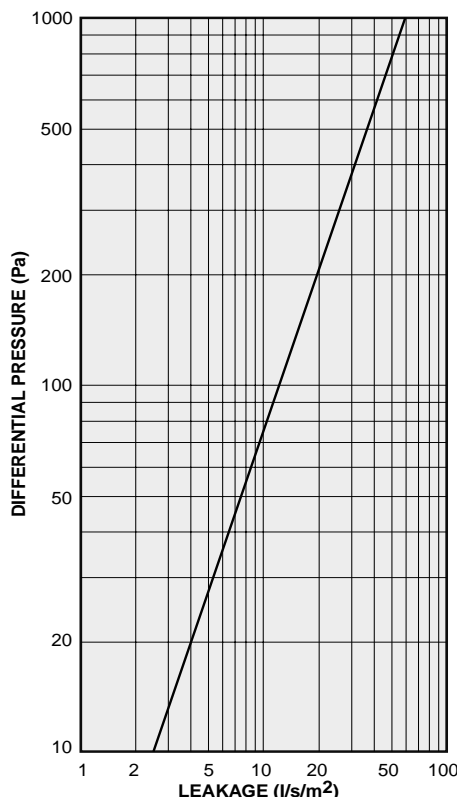
Dampers to the maximum size of 1000mm wide x 1000mm high generally require no more than 10Nm torque.

For sizes above this to a maximum size of 2080mm wide x 1000mm high require no more than 18Nm torque,

The above torques are to rotate the damper from the fully closed to the full open position against the recommended maximum total system pressure of 1000 pascals and the maximum duct velocity of 12 m/s.

Damper Leakage ES36

1000mm wide x 1000mm high Damper



Weights

ES35 and ES36 Approximate Weights (Kg)

Height	Width				
	200	400	600	800	1000
200	3.8	5.4	7.1	8.7	10.4
400	6.8	9.5	12.2	15.0	17.7
600	8.6	11.8	15.0	18.2	21.4
800	10.2	14.0	17.7	21.4	25.2
1000	12.6	17.4	22.1	26.8	31.5

Selection

Please refer to individual sections of the brochure for specific product detailed information.

	Aerofoil	Aeroseal	ES35	ES36
Flanged Style Casing - Minimum 100 x 100 (Height increments of 50mm)	●	●		
Flanged Style Casing - Minimum 200 x 200 (Height increments of 1mm)			●	●
Flanged Style Casing - Maximum 1000 x 1000	●	●		
Flanged Style Casing - Maximum 2080 x 1000			●	●
30mm Flange Style	●	●		
40mm Flange Style			●	●
Flanged Casing Depth - 65mm	●	●		
Flanged Casing Depth - 160mm			●	●
Spigotted Style Casing - Maximum 1000 x 1000	●	●		
Circular Option - Maximum 1000 dia.	●	●		
Flat Oval Option - Maximum 1000 x 500	●	●		
Air Balancing Only	●		●	
Shut-off Function		●		●
Opposed Blade Movement	●	●	●	●
Parallel Blade Movement (Optional)			●	●
Manual Geared Control (Standard for Aerofoil)	●			
Manual Quadrant Control (Standard for Aeroseal)	●	●	●	●
Extended Spindle Control (Standard for ES35 and ES36)	●	●	●	●
Electrical Control (Optional)	●	●	●	●
Blade Drive Mechanism mounted out of the airstream	●	●	●	●
Casing Leakage Conforms to DW144 Class C up to 1000Pa	●	●	●	●
Galvanised Case with Stainless Steel Blades (Standard)	●	●		
Galvanised Case with Galvanised Blades (Standard)			●	●

Electrical Controls (Option E)

		Open / Close (24/240V)			Modulating (24V)			Spring Return (24/240V)	
		4Nm LM	8Nm NM	18Nm AM	4Nm LM	8Nm NM	18Nm AM	4Nm LF	15Nm AF
Air/Shield Aerofoil (square/rectangular/ Flat Oval)	Up to 0.25m sq From 0.26m sq to 1m sq	●	●		●	●		●	●
Air/Shield Aerofoil (Circular)	Up to 500mm dia From 501mm dia to 1000mm dia	●	●		●	●		●	●
Air/Shield Aeroseal (square/rectangular/ Flat Oval)	Up to 0.09m sq From 0.091m sq to 0.25m sq From 0.26m sq to 1m sq	●	●	●	●	●	●		●
Air/Shield Aeroseal (Circular)	Up to 300mm dia From 301mm dia to 500mm dia From 501mm dia to 1000mm dia	●	●	●	●	●	●	●	●
Energy/Shield ES35 FLA (Square/Rectangular)	up to 0.32m sq From 0.32m sq to 1.0m sq From 1.0m sq to 2.16m sq	●	●	●	●	●	●		●
Energy/Shield ES36 FLA (Square/Rectangular)	Up to 0.16m sq From 0.16m sq to 0.64m sq From 0.64m sq to 2.16m sq	●	●	●	●	●	●		●

Standard Ordering Procedure Air/Shield

- Quantity** Number Required.
- Series** Air/Shield Aerofoil or Air/Shield Aerofoil.
- Type** FLA-Flanged Casing or SPG-Spigotted Casing, in Rectangular, Circular or Flat Oval Configuration.
- Control Options**
- M** Manual Control
(fitted as standard to Series Air/Shield Aerofoil).
 - Q** Manual Quadrant Control
(always fitted as standard to Series Air/Shield Aerofoil and Stainless Steel options).
 - E** Electrical Operator.
24V or 230V open/closed
24V or 230V spring return
or 24V modulating.
 - X** Extended Shaft Control.

Example

2	/	Air/Shield Aerofoil	/	FLA	/	Q	/	800(W) x 400(H)
Quantity		Series		Type		Control Option		Duct Size

Standard Ordering Procedure ES35 ES36

- Quantity** Number Required.
- Series** Energy/Shield ES35 or Energy/Shield RS36 (Flanged style casing only)
- Operation**
- R** Opposed Blade Movement
 - P** Parallel Blade Movement
- Control Options**
- Q** Manual Hand Quadrant
 - E** Electrical Operator.
24V or 230V open/closed
24V or 230V spring return
or 24V modulating.
 - X** Extended Shaft Control (Fitted as standard on ES35 and ES36).

Example

2	/	Energy/Shield ES35	/	R	/	X	/	1400(W) x 400(H)
Quantity		Series		Operation		Control Option		Duct Size

For further application, technical and pricing information, please refer to Actionair Sales Office.

actionair
no compromise...

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Quality System
 Certificate No 017
 Assessed to ISO 9001:2000