Actionair Energy/Shield

Heavy Duty Air Control and Shut-off Dampers

Features and Design Guide

Damper suitable for systems requiring air control and very low closed blade leakage characteristics.

Suitable for high pressure and high velocity applications.

Available in Flanged or Spigotted type casings.

Product Range

Series Airbalance

Aluminium bladed dampers for air control and system balancing.

Series Airstop

Aluminium bladed dampers for air control, system balancing and low closed blade leakage.

Series Airtight

Stainless Steel bladed dampers for air control, system balancing and low closed blade leakage.

Dampers Designed and Built in Britain
Patent Nos. pending.

actionair

The Range

The Energy/Shield range of quality engineered dampers are suitable for air conditioning and ventilation systems requiring air control and very low closed blade leakage characteristics, especially those involving high pressure and high velocity applications.

These heavy duty, aerodynamic, precise movement, opposed blade dampers can be either factory fitted with manual, electric or pneumatic controls. Dampers can be supplied in a flanged style casing or complete with spigotted adaptor plates.

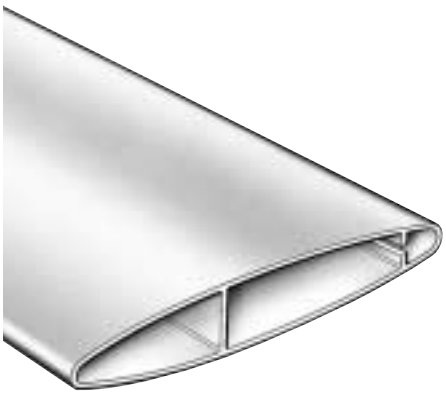
Application Parameters

Energy/Shield Dampers are designed for application in normal dry filtered air systems. When required for a modulating function, or if exposed to fresh air intakes, and/or inclement conditions, the damper should be subject to a planned inspection programme.

Energy/Shield Dampers to maximum width and height dimensions can be used where the operating total system pressure is up to 2000 Pascals and the duct velocities to 20 m/second.

For specialist applications and parameters greater than those stated please refer to our Customer Service Office.

Blade Features



Series Airbalance
Aluminium

Series Airbalance for air control and system balancing having reinforced aerodynamic aluminium blades, only in mill finish, within an all welded robust galvanised housing. Suitable for systems with a temperature range of –20 °C through to +70 °C.

Series Airstop
Aluminium

Series Airstop for air control, system balancing and low closed blade leakage characteristics having reinforced aerodynamic aluminium blades only, in mill finish with synthetic blade edge and side seals, within an all welded robust galvanised housing. Suitable for systems with a temperature range of 0 °C through to +70 °C.

Series Airtight
Stainless Steel

Series Airtight for air control, system balancing and low closed blade leakage characteristics having reinforced aerodynamic double skin Type 1.4016 (430) Ferritic Stainless Steel blades with synthetic leading and trailing edge seals and double side seals within an all welded robust galvanised housing. Suitable for systems with a temperature of 0 °C through to +70 °C. Optional blade construction Type 1.4401 (316) Austenitic Stainless Steel.

Casings Features

Blade Stability

Blade stabilisers and tie bars are provided as standard on Series Airtight Dampers with widths greater than 1250mm and Series Airstop and Series Airbalance Dampers with widths greater than 1100mm. This eliminates bowing and/or distortion due to fan and system characteristics. Thus giving the obvious benefits of improved aerodynamic control and the absolute lowest possible air leakage in the fully shut off position for the Series Airstop and Airtight Dampers.

Series Airtight

The semi-circular synthetic blade stabilisers are fixed to each side of the blade to form a complete circle. This allows the blade to be held rigidly between the vertical steel tie bars.

Blade Drive Mechanism

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

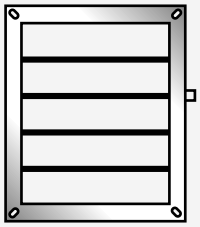
The damper casing having a single penetration for the drive control shaft making these dampers suitable for inclusion into air distribution systems of Class A and B of Eurovent Document 2/2 and Test Procedures for Classes A, B and C of HVCA Ductwork Specification DW144.

Flanged

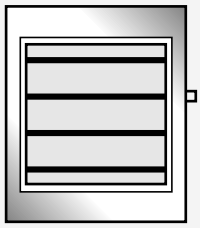
A galvanised steel casing of all welded corner construction having peripheral flanges with pre-punched elongated corner holes to suit proprietary duct flanges. Optional stainless steel flanged casings are available in either Type 1.4016 (430) Ferritic or Type 1.4401 (316) Austenitic material.

Spigotted

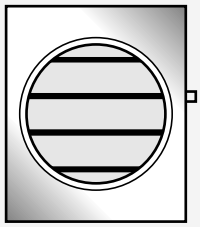
Dampers can be factory fitted with galvanised spigotted adaptor plates for square, rectangular, circular and flat oval duct connections. As an option these spigotted adaptor plates are available in Type 1.4016 (430) Ferritic or Type 1.4401 (316) Austenitic Stainless Steel.



Type FLA Square/Rectangular



Type SPG Square/Rectangular

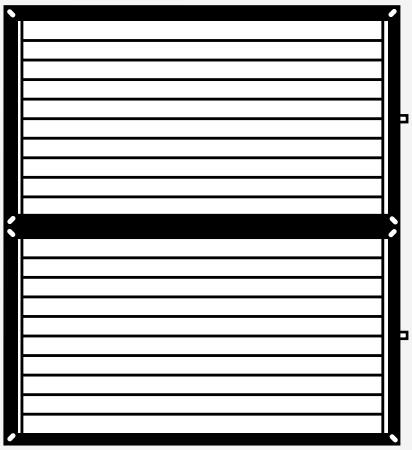


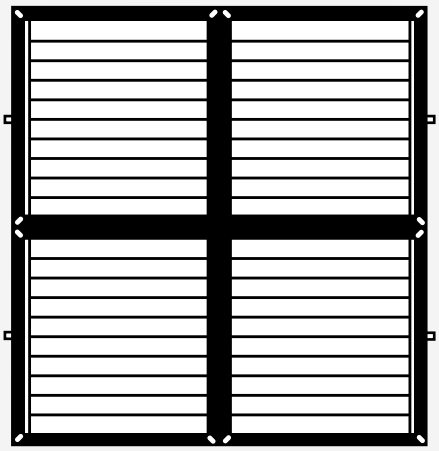
Type SPG Circular

Type SPG Flat Oval

Multiple Assemblies

Square and rectangular casings are available in multiple module arrangements supplied complete with blanking strips for site fixing by others.

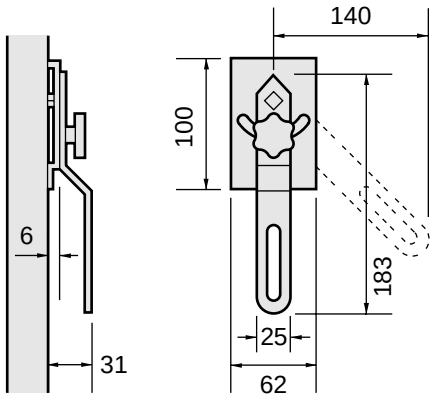




Control Options

Manual Quadrant Control
(Option Q)

Always fitted as standard
consists of a dark brown steel handle, blade position locking facility and quadrant bracket with visual position indication.

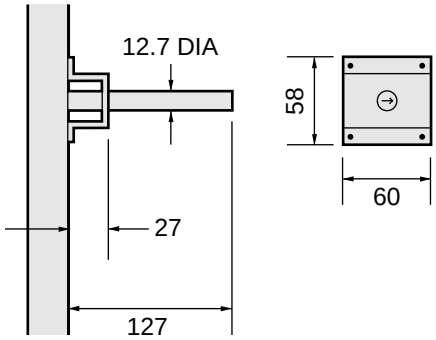


Electrical Controls
(Option E)

Factory fitted Belimo Actuators for 24V or 240V open/closed or spring return operation and 24V modulating are available.
These will comply with EMC Directive 89/336/EEC.

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.



Pneumatic Controls

Factory fitted Pneumatic Actuators are available to suit specific client specification.

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 requirement is also dependent on the fan and system characteristics. Generally, Energy/Shield Dampers to a size range up to 0.25 square metres and 500mm diameter require no more than 15Nm torque.

For larger dampers up to 1.5 square metres and 1000mm diameter require no more than 30Nm torque.

For dampers above 1.5 square metres to our maximum of 2.25 square metres no more than 50Nm torque is required.
The above torques are to rotate the damper blades from the fully closed to the fully open position against the recommended maximum total system pressure of 2000 pascals.

Factory fitted Belimo Electrical Controls will be selected to suit the torque requirements of the damper.

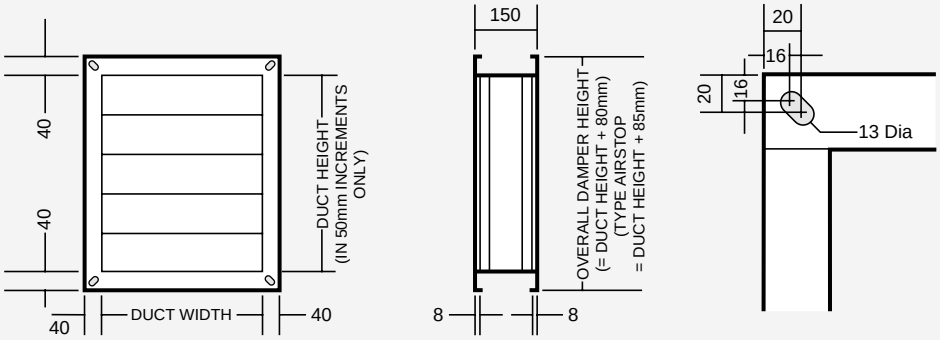
Approximate Weight (Kg)

Square/ Circular Duct Size	Type FLA	Type SPG Rectangular	Type SPG Circular
200	4.0	5.0	6.8
300	6.2	8.5	11.5
400	9.0	11.6	16.3
500	11.8	14.2	21.0
600	15.1	19.1	29.1
700	18.6	24.2	37.1
800	22.6	29.4	45.2
900	26.8	33.6	53.2
1000	31.6	38.2	61.3

For Type SPG Flat Oval weights please contact Customer Service Office.

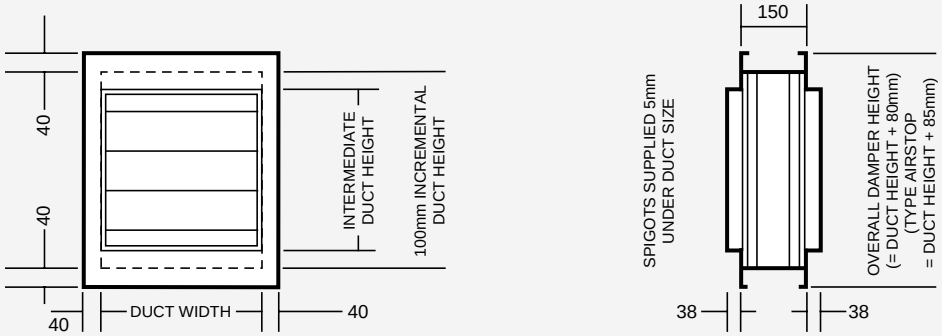
Dimensional Data

Flanged Casing (Type FLA)



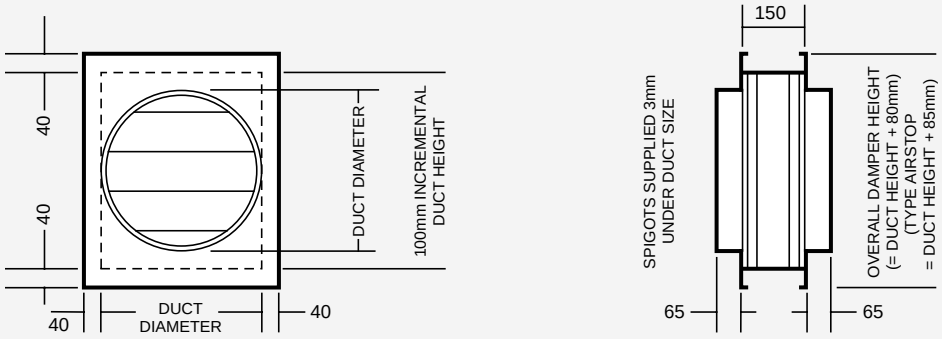
Spigot Casing (Type SPG Rectangular)

SPG rectangular spigots are supplied 5mm under duct size.



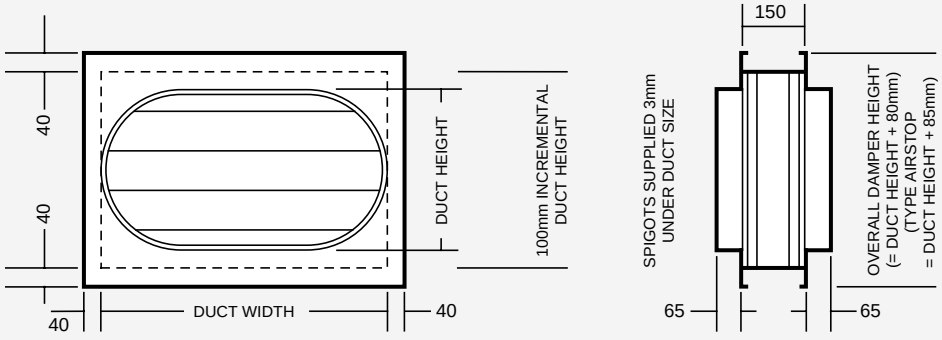
Spigot Casing (Type SPG Circular)

SPG circular spigots are supplied 3mm under duct size.



Spigot Casing (Type SPG Flat Oval)

SPG flat oval spigots are supplied 3mm under duct size.



1. Type FLA widths in any size from 200mm to 2000mm. Widths greater than 1500mm are restricted to a height of 1000mm.
Type FLA heights from 200mm to 1500mm in 50mm increments. Heights greater than 1000mm are restricted to a width of 1500mm.

2. Type SPG rectangular widths in any size from 100mm to 2000mm. Widths greater than 1500mm are restricted to a height of 1000mm.
Type SPG rectangular heights in any size from 100mm to 1500mm. Heights greater than 1000mm are restricted to a width of 1500mm.

3. Type SPG circular in any size from 100mm diameter to 1000mm diameter.

4. Type SPG flat oval widths in any size from 300mm to 2000mm.
Type SPG flat oval heights in any size from 100mm to 500mm.

5. All dampers are suitable for either horizontal or vertical mounting.

6. Series Airtight Damper widths greater than 1250mm have blade stabilisers and 22mm square central vertical tie bars.

Series Airstop and Airbalance damper widths greater than 1100mm have blade stabilisers and 22mm square central vertical tie bars.

7. All overall damper widths are duct widths/diameters + 80mm.
Type SPG intermediate duct heights/diameters selected from next larger 100mm incremental duct height with spigot heights being centrally positioned within overall damper height.
Type SPG intermediate duct heights/diameters less than 200mm to 100mm minimum are selected from the 200mm incremental duct height with spigots being centrally positioned within overall damper height.

8. A square solid stainless steel drive shaft fitted to, or nearest to, central blade of damper for direct connection and interchangeability of all control options.

Dampers must not be transported, stored or mounted in such a manner that the blades run vertically.

Acoustic Data

The data presented is from the Laboratory Determination of Acoustic and Aerodynamic Performance of the Energy/Shield Air Control and Shut-off Dampers.
A programme of extensive tests was carried out in the Reverberation Chamber and North Transmission Chamber of Sound Research Laboratories Limited, Holbrook Hall, Sudbury, Suffolk, generally in accordance with BRITISH STANDARDS Nos., 4196, 4773, 4856, 4857 and 4954.
This independent test facility is approved under the NAMAS Scheme.
For a selection of duct velocity within the operational parameters of the dampers a resultant pressure drop can be determined and the sum of these two components applied to the Velocity X Pressure Drop Vs Sound Power Level Graph. The graph is the result of a full range of acoustic tests on Energy/Shield Air Control and Shut-off Dampers with the blades set from fully open through positions 1, 2 and 3.
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 10 m/sec.
Energy/Shield Damper fully open.
Pressure Drop = 12.5 Pa (Table 1).
Multiply Velocity X Pressure Drop
10 x 12.5 = 125
From Sound Power Graph (Table 2) plot 125 on the horizontal Velocity/Pressure on the outlet (induct) graph to obtain 62 dBW and similarly for breakout to obtain 48 dBW. Subtract corrections to provide full spectrum analysis.

Pressure Drop Vs Velocity

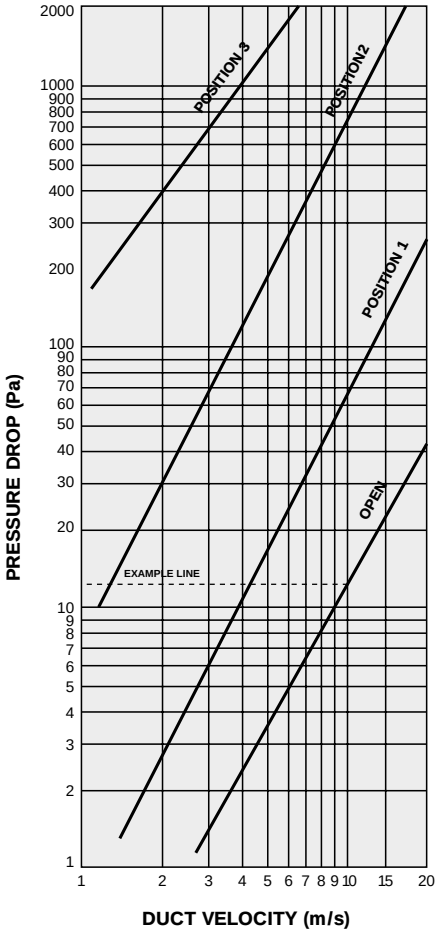


Table 1

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

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

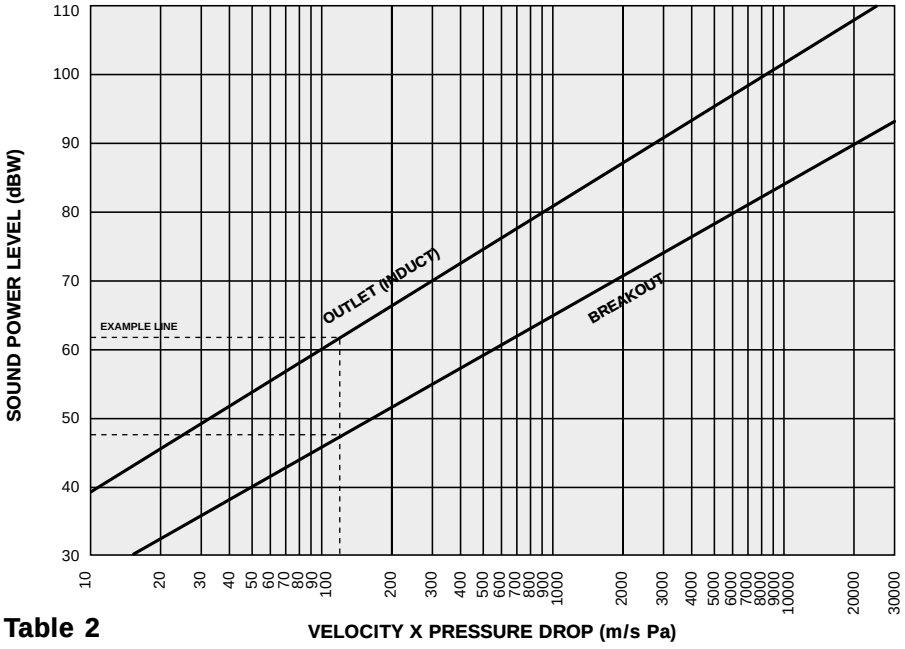


Table 2

Energy/Shield Outlet (in duct) Spectrum Correction

Octave band	63	125	250	500	1K	2K	4K	8K	Hz
OPEN	0	– 4	– 10	– 12	– 16	– 21	– 27	– 32	dB
POSITION 1	– 7	– 17	– 21	– 23	– 26	– 29	– 33	– 36	dB
POSITION 2	– 4	– 9	– 13	– 17	– 19	– 20	– 25	– 29	dB
POSITION 3	– 14	– 18	– 21	– 20	– 19	– 17	– 22	– 26	dB

Energy/Shield Breakout Spectrum Correction

Octave band	63	125	250	500	1K	2K	4K	8K	Hz
OPEN	– 11	– 6	– 3	– 10	– 17	– 26	– 33	– 38	dB
POSITION 1	– 16	– 13	– 12	– 19	– 25	– 35	– 43	– 45	dB
POSITION 2	– 19	– 16	– 19	– 23	– 26	– 35	– 43	– 51	dB
POSITION 3	– 28	– 25	– 25	– 28	– 31	– 36	– 42	– 42	dB

Damper Leakage

Energy/Shield Series Airtight and Series Airstop closed blade leakage 1000mm wide x 1000mm high Damper.

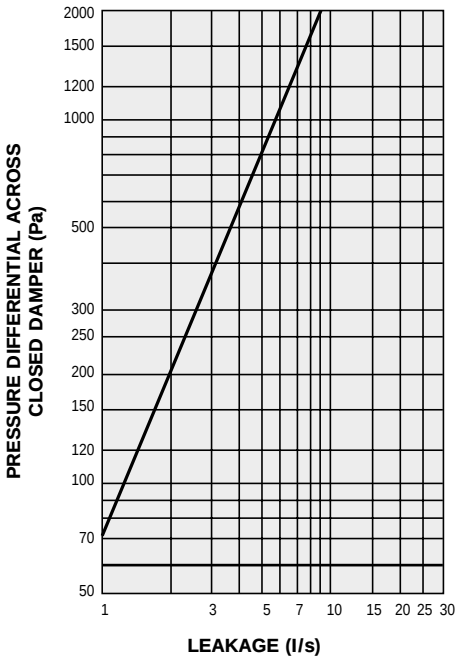


Table 3

Customer Service
Actionair provides quality products backed by a dedicated team committed to providing the very best in customer service. Offering experienced technical backup, comprehensive sales and administrative customer support, product commissioning and maintenance service.

Specification

Energy/Shield
All dampers can be factory fitted with one of the following controls;

Type Q Manual quadrant control. (fitted as standard)
Type E Belimo actuator either 24V or 240V open/closed 24V or 240V spring return or 24V modulating.
Type X Extended shaft control.
Type P Pneumatic actuator.

Energy/Shield range of dampers are suitable for mounting in the vertical plane (with the blades running horizontally) and in the horizontal plane.

Energy/Shield Airbalance
air control and system balancing dampers comprising of 100mm extruded aluminium inner reinforced aerodynamic blades in mill finish with synthetic blade end bearings. Housed in a galvanised steel frame having integral peripheral flanges, either prepunched elongated corner holes to suit proprietary duct flanges (Type FLA) or with galvanised spigotted adaptor plates for square, rectangular or flat oval duct connections (Type SPG) which shall provide with all welded corners a dust proof casing of high strength and rigidity. Blade widths greater than 1100mm having the blade stabiliser system fitted. The totally enclosed precise movement opposed blade drive mechanism positioned out of the airstream for protection against damage is hard wearing and free running.

Energy/Shield Airbalance as supplied by Actionair.

Energy/Shield Airstop
air control and system balancing and low closed blade leakage dampers comprising of 100mm extruded aluminium inner reinforced aerodynamic blades in mill finish with synthetic trailing blade edge and side seals and blade end bearings. Housed in a galvanised steel frame having integral peripheral flanges, either prepunched elongated corner holes to suit proprietary duct flanges (Type FLA) or with galvanised spigotted adaptor plates for square, rectangular or flat oval duct connections (Type SPG) which shall provide with all welded corners a dust proof casing of high strength and rigidity. Blade widths greater than 1100mm having the blade stabiliser system fitted. The totally enclosed precise movement opposed blade drive mechanism positioned out of the airstream for protection against damage is hard wearing and free running.

Energy/Shield Airstop as supplied by Actionair.

Energy/Shield Airtight
air control and system balancing and low closed blade leakage dampers, comprising of 100mm reinforced stainless steel aerodynamic blades with synthetic blade edge and side seals and blade end bearings. Housed in a galvanised steel frame having integral peripheral flanges, either prepunched elongated corner holes to suit proprietary duct flanges (Type FLA) or with galvanised spigotted adaptor plates for square, rectangular or flat oval duct connections (Type SPG) which shall provide with all welded corners a dust proof casing of high strength and rigidity. Blade widths greater than 1250mm having the blade stabiliser system fitted. The totally enclosed precise movement opposed blade drive mechanism positioned out of the airstream for protection against damage is hard wearing and free running.

Energy/Shield Airtight as supplied by Actionair.

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no compromise...

Standard Ordering Procedure

Please Specify

Quantity Number Required.

Series Energy/Shield Airbalance, Energy/Shield Airstop or Energy/Shield Airtight.

Type FLA-Flanged Casing or SPG-Spigotted Casing, in Rectangular, Circular or Flat Oval Configuration.

Control Options

Q Manual Quadrant Control (always fitted as standard).

E Electrical Operator.
24V or 240V open/closed
24V or 240V spring return
or 24V modulating.

.

X Extended Shaft Control.

P Pneumatic Control.

Duct Size Nominal Damper Size

Example

2 / Energy/Shield Airstop / FLA / Q / 1000(W) x 800(H)

Quantity	Series	Type	Control Option	Duct Size

For further application, technical and pricing information, please refer to our Customer Service Office.

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Quality System Certificate
No. 017 - Assessed to
BS 5750 Part 2/ISO 9002/EN 29002

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Email: sales@actionair.co.uk Website: www.actionair.co.uk

Product Range

Smoke/Shield PTC™
Automatic Smoke and Fire Dampers

Vent/Shield PTC™
Automatic Smoke Release Dampers

Hot/Shield PTC™
High Operating Temperature
Automatic Smoke and Fire Dampers

Hot/Shield Vent PTC™
High Operating Temperature
Automatic Smoke Release Dampers

Actionpac LNS
Addressable Smoke and Fire Damper Control Systems

Actionpac EM
Electro Mechanical Smoke and Fire Damper Control Systems

Fire/Shield
Stainless Steel Bladed Curtain Fire Dampers

Trans/Shield
Air Transfer Smoke and Fire Dampers

Air/Shield
System Air Balancing and Shut-off Dampers

Energy/Shield
Heavy Duty Air Control and Shut-off Dampers

Flame/Shield
Adjustable Coated Baffle Grease Filters

Access/Shield
Removable Hinged Insulated Access Doors

Hydropac PHW 230
Horizontal Waterside Control Fan Coil Units

Aeropac PHA 230
Horizontal Airside Control Fan Coil Units

Hydropac PHW 170
Horizontal Slimline Waterside Control Fan Coil Units

Hydropac PVW 230
Vertical Waterside Control Fan Coil Units