

# Volume Control Damper

Controllability is one of the essential key factors for an effective natural ventilation system with the ability to regulate airflows accurately to meet occupancy levels and temperature requirements very important.

The patented Gilberts volume control damper is a unique design that is fully adjustable from full open to full closed. When closed the damper has an extremely low leakage rate that prevents all draughts and system inefficiencies.

The casing is manufactured from low conductivity material which prevents any cold bridge effect allowing total isolation from internal to external areas. Furthermore the damper comprises a double insulated blade arrangement which means that the damper has a very low u value (when closed) of 1.6 w/m<sup>2</sup> °C, which is as good as a sealed double glazed unit preventing wasteful energy heat loss or gain. The insulation also provides a secondary acoustic reduction effect. For less sensitive areas, such as for exhaust, damper units can also be specified without insulation without affecting leakage rates

The damper will typically be motor actuator controlled but can also be manually operated if required.

In order to establish the increase in resistance that will apply as the damper closes a graph showing pressure drop against percentage open is detailed on page 17.

## Current Building Regulation Requirement

Graph No.2 illustrates current building regulations maximum leakage rate of 10m<sup>3</sup>/H/m<sup>2</sup> and the actual leakage rate of a 1m<sup>2</sup> damper.

The current damper design is approximately 40% below these regulation requirements.

## Casing Leakage Rating

Testing was conducted in accordance with BS/EN 1751 in order to establish the casing leakage rate for a 1m<sup>2</sup> damper. Following these tests it was established that the unit conformed with Class C which is also equivalent to Ductwork DW 144 specifications

## Damper Drive Options

- Ref 1 - Manual Handle Operation
- Ref 2 - Manual Teleflex Operation
- Ref 3 - (3 Point) SM24A Actuator AC 24v/DC 24v
- Ref 4 - (3 Point) SM24A-S Actuator AC 24v/DC 24v
- Ref 5 - (3 Point) SM230A Actuator AC 100~240v
- Ref 6- (3 Point)SM230A-S Actuator AC 100v/DC 240v
- Ref 7 - (Modulating) SM24A-SR Actuator AC 24v/DC 24v
- Ref 8 - (Modulating) SM24A-M Actuator AC 24v/DC 24v
- Ref 9 - (Modulating) SM230A-SR Actuator AC 100~240v



## Torque Rating

Tests were conducted on a 1m<sup>2</sup> damper to establish the drive torque requirement under operating conditions. It was confirmed that 4 Nm was required to operate the damper rising to 12 Nm to compress the seals for total closure. Minimum recommended motor torque for this size of unit = 20nm. For reduced damper sizes the following would be recommended:- 2Nm reduction for every 100 mm reduction in damper height.

## Pressure Leakage

In order to meet current building regulations graph details are provided to illustrate the air leakage rates against various pressure differentials (Graph Ref. 2)

The data has been derived from a 1 m<sup>2</sup> damper tested in accordance with BS EN 1751 and indicates the maximum leakage now acceptable under current building regulations against actual leakage rates at 50 Pa differential pressure.

## Manual Control



## Motor Control





## Thermal Insulation

Thermal transmittance testing was carried out in accordance with the requirements laid down in BS EN 1751 to determine the amount of heat that would be transferred through a 1 m<sup>2</sup> damper assembly. Testing was carried out with the blades insulated and also without insulation with the following results:- Mill finish damper assembly after a minimum test period of 4 hours.

'U' value (Wm<sup>2</sup>/K) = 1.99

With damper blades insulated on both sides with 6.0 mm of pyrosorb insulation material.

'U' value (Wm<sup>2</sup>/K) = 1.52

This compares favourably with values for a typical double glazed panel.

'U' values in W/m<sup>2</sup>K for vertical glazing subject to normal exposure conditions according to BS 6993 Part 1

Unit make-up	Air space				
	6	10	12	16	20
4 mm/air 4 mm	3.18	2.87	2.78	2.68	2.67
4 mm/argon/4 mm	2.93	2.69	2.62	2.56	2.55
4 mm/air/4 mm k	2.59	2.07	1.91	1.73	1.70
4 mm/argon/4 mm k	2.18	1.73	1.60	1.5	1.48
4 mm/air/4 mm/air/4 mm	2.25	1.95	1.87	1.78	1.77

## Pressure Drop / Volume Graph (based on 1m<sup>2</sup> High efficiency damper)

Open (Ref. 1 Various open positions)

Full Closed (Ref. 2 Leakage)

