

# 1. HD/LL – Heavy Duty/Low Leakage Damper (Shut off)

## Introduction

For control, balancing and shut off of supply and extract air systems where high pressures and velocities may be experienced. All dampers are fitted with opposed blade action, airfoil blades as standard. The blades are adjusted via the robust, hand operated, lockable quadrant or with an optional extended spindle suitable for motorisation. The linkage system is enclosed and positioned out of the airstream. Casing leakage conforms to HVCA specification DW144 and Eurovent 2/2 classes A on casing leakage and Class 3 on blade leakage.

## Construction

The casing is available fully flanged or with square/rectangular, circular or flat oval spigots and is manufactured from galvanised mild steel. The blades are extruded aluminium airfoil section, low leakage model is complete with blade and side seal gaskets. Where a height of less than 100mm is required a blank plate fills the space (i.e. 300×350).

## Size

From 300×100 to 1300×1300 (single section) and up to 3900 (W) × 1300 (H) with a single drive. Multiple assemblies can also be supplied. Low leakage model can be provided for all sizes (divisible by 100). Height is always +10mm to allow for blade gaskets (i.e. 400×400mm will be 400×410mm). Depth is 125mm from front to back.

## Specifications

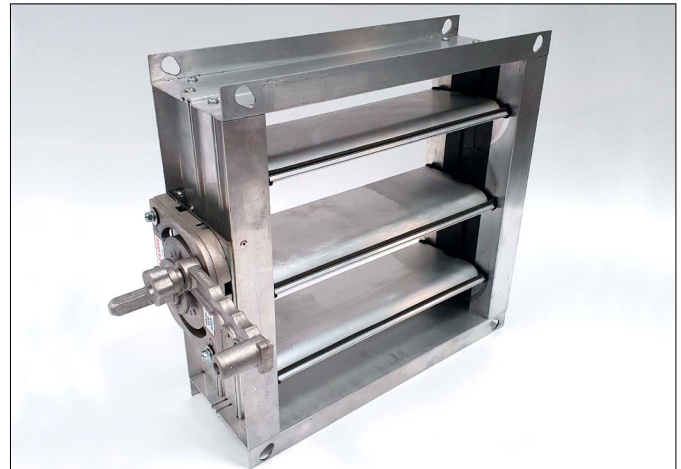
Unless stated otherwise, flange models are suitable for classes A, B, C & D of DW144, with spigot models suitable for classes A, B & C.

Conforms to Eurovent 2/2 classes A-C (see results page 8).

Independent performance tests for pressure loss and leakage. Test reports 331552 – Feb 2016.

## Blades

The 100mm wide blade is offered as standard as an extruded aluminium airfoil section. All blades are fitted to 19mm spindles. All models are available with opposed blades. Fitted to the ends of the aluminium blades are end seal flocked caps to alleviate, noise generation and minimize air leakage. All blades are fitted with rubber seals. This requires the height to be increments of 10mm to achieve leakage performance (i.e. 300×300mm is 300×310mm high).



## Multiple Assemblies

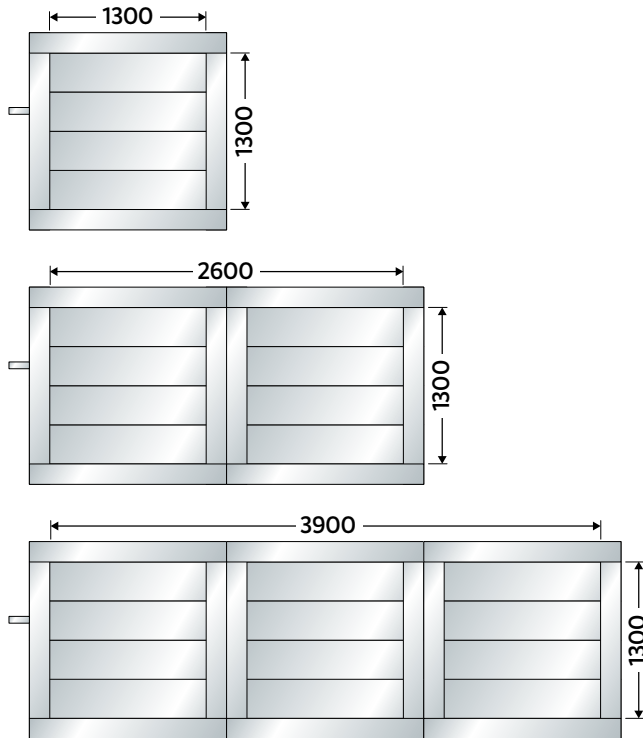
Illustrated below are several variants to multiple section units. Blade lengths are up to 1300mm with 30mm wide centre mullions used where case widths extend to sizes greater than maximum blade length.

## Low Leakage Model

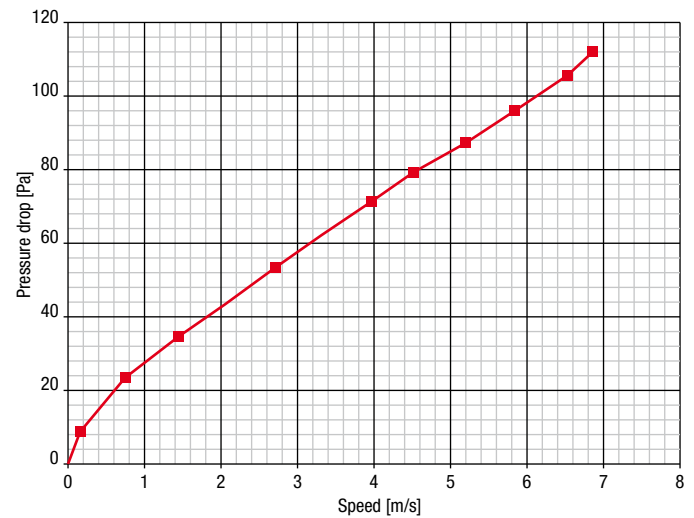
It is important to note that the low leakage model is only supplied up to 1300mm in width and height in a single section with multiple sections supplied for units greater than 1300mm up to max 3900×1300 (single drive).

When there are transportation restrictions, large multiple units may be shipped in individual sections for site assembly by others (on request). Joining strips are supplied un-drilled unless requested otherwise.

Multiple sections / Single Drive:



Test report No. 224203  
Flow rate/Pressure drop



Special Note:

AMS can manufacture to individual specifications and applications. Illustrated above are standard variants with other variants available to order.

For applications which necessitate the blades to be installed vertically, AMS sales office must be informed to ensure such sizes are within working norms.

Single and Multiple Damper arrangements are designed to be installed with blades in the horizontal plane. Drive spindle is always fitted centrally. Alternative positions are possible to special order.

Weight Chart

Damper Height (mm)	Damper Width (mm)									
	200	300	400	500	600	700	800	900	1000	1300
100	3.0	3.0	4.0	5.0	6.0	6.0	7.0	8.0	9.0	15.0
200	4.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	18.0
300	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	20.0
400	6.0	7.0	9.0	10.0	12.0	13.0	14.0	15.0	16.0	25.0
500	7.0	8.0	10.0	12.0	13.0	14.0	16.0	17.0	18.0	27.0
600	8.0	10.0	12.0	13.0	15.0	17.0	18.0	19.0	21.0	29.0
700	9.0	12.0	13.0	16.0	18.0	20.0	21.0	22.0	23.0	32.0
800	10.0	13.0	14.0	17.0	19.0	21.0	23.0	25.0	26.0	34.0
900	12.0	14.0	16.0	19.0	21.0	23.0	24.0	26.0	27.0	36.0
1000	13.0	15.0	18.0	21.0	23.0	26.0	27.0	28.0	32.0	40.0
1300	15.0	17.0	20.0	25.0	29.0	33.0	38.0	40.0	45.0	60.0

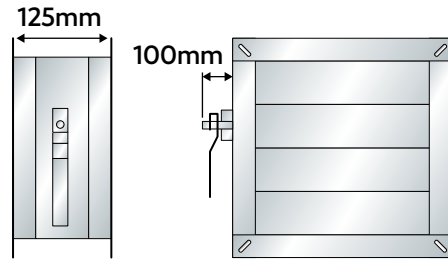
(Kg)(Flangefit Model – Aluminium Blades)

These values have been rounded up and down to whole numbers and are illustrated for estimation purposes only.

## Control Options HD/LL

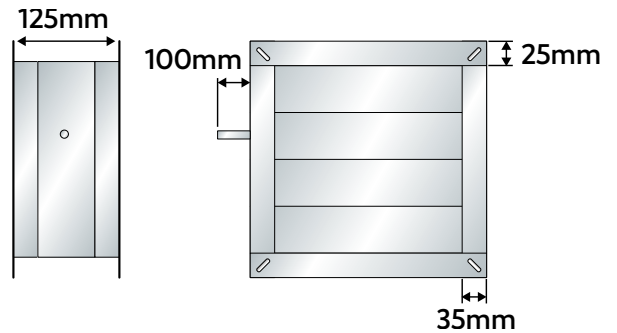
### Option HC - Hand Control (as standard)

Our unique hand-lockable quadrant is supplied complete from the factory. Conversion to motorised is easily completed by removing quadrant handle leaving extended spindle exposed.



### Option ES - Extended Spindle

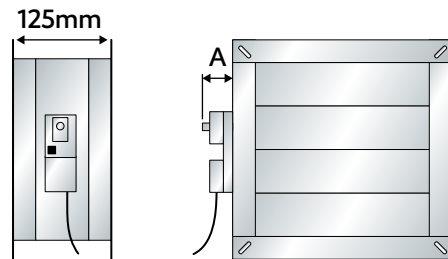
When the specification requires the HD Series Damper to be supplied for motorisation by others, AMS supplies the damper with a spindle 200mm in length, leaving a generous protrusion to mount motor of approx. 100mm.



### Option EM - Electric Motor

The HD Series Damper can be supplied factory fitted with electric actuators offering a choice of methods of operation. A = will vary depending on the type of motor specified. For additional technical details, please contact AMS Sales Office for data sheet. Height is always +10mm to allow for blade gaskets (i.e. 400x400mm will be 400x410mm).

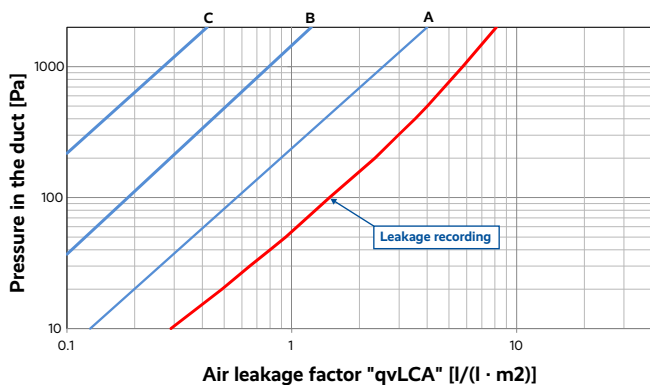
**Note:** H nominal is always + 10mm



## Performance, Case + Blade Leakage

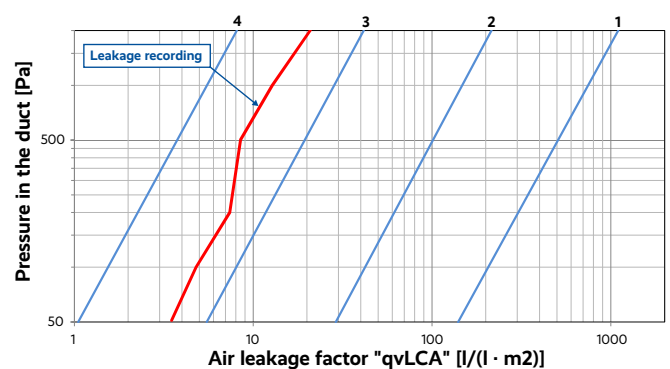
### Performance Characteristics

#### Case leakage Class "A"



Red = HD/LL performance

#### Leakage through closed blade "3"



Red = HD/LL performance

# Torque Chart For Motor Selection (Passive conditions)

Actuating Force Class 2 EN 1751

5 Nm
10 Nm
15 Nm

Height ↓	100/700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000
110/710	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
810	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
910	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1010	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1110	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1210	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1310	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1410	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1510	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1610	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1710	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1810	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
1910	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2010	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2210	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
2310	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

**Note:** For pressure up to 500Pa use 10 Nm @ 0.5m<sup>2</sup> up to 1.5m<sup>2</sup> and 15 Nm above 1.5m<sup>2</sup>.

## Operating Temperature

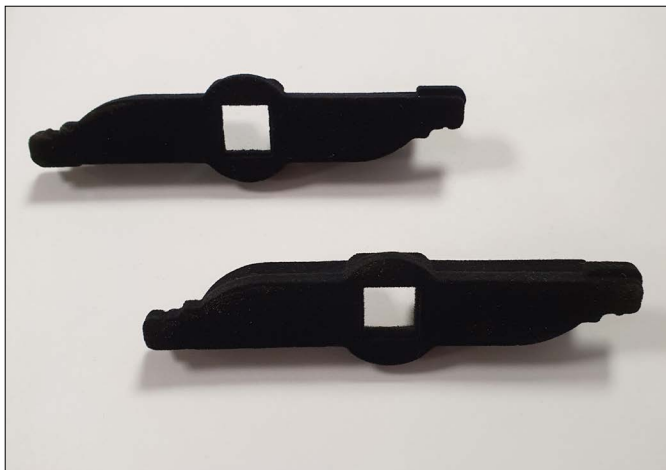
10°C to + 110°C as standard.

Blade Edge Seals.

TPV used in gasket resists up to 120°C.

## Construction Components

### Flocked blade end caps



Flocked end caps uniquely provide a better low leakage performance by minimizing the friction between the blade and the casing. As standard moulds will achieve a high standard of leakage.

### Quadrant handle and shaft



All aluminum handle and square shaft guarantees non slippage between the drive handle and the operation (blade movement). This unique handle offers more leverage to enable larger damper sizes to be opened and closed with minimum force.

## Side Seal Gasket

Flocked endcap comprising of polypropylene and soft part TVPS.

HD/LL a CLASS 3 Damper, compliant to the EN 1751:2014 norm, certified by 'ISTITUTO GIORDANO' (certificate: 331552).

We introduced a new special flocked component, NG007A\_B and a new gasket, G0013, which both guarantee a perfect air tightness of the damper according to the standard required by the above mentioned norm.

The CLASS 3 damper has hidden gears frame which allow a constant protection from the dirt and guarantee the proper rotation of the blade for a longer working life.

The new side seal is comprised of a unique TPVS – soft part and polypropylene – hard part, and is fastened on both sides of the blade, in order to guarantee the air tightness required by the EN 1751:2014 norm.

### Class 3 Gasket



## Test Results (EN 1751)

### Case leakage

Nominal pressure [Pa]	Test pressure [Pa]	Measured flow rate [Pa]	Flow Rate [l/s]	Reference area [m2]	Damper leakage l/ (l-m2)
10	10	0.5	0.14	0.5	0.29
20	20	0.9	0.25		0.49
30	30	1.2	0.33		0.65
40	40	1.4	0.4		0.8
50	50	1.7	0.47		0.94
100	100	2.6	0.73		1.47
200	200	4.2	1.17		2.34
300	301	5.4	1.49		2.98
400	400	6.4	1.77		3.54
500	501	7.2	2.01		4.01
1000	1007	10.4	2.88		5.77
2000	2000	14.6	4.06		8.12

### Leakage through closed blades(s)

Nominal pressure [Pa]	Test pressure [Pa]	Measured flow rate [Pa]	Flow Rate [l/s]	Reference area [m2]	Damper leakage l/ (l-m2)
50	51	12.6	3.5	1	3.5
100	100	17.3	4.8		4.8
200	200	26.5	7.4		7.4
500	502	30.7	8.5		8.5
1000	1000	46	12.8		12.8
2000	2010	75.4	20.9		20.9

Test report No. 331552

HD-LL-VCD meets the requirements of standard EN 1751:2014 for the highest class A relating to case leakage and class 3 (2nd highest rating) relating to leakage through closed blade(s).