

## **Highly-Tight Shut-Off Dampers Types AKD and KLB**



### **LTG Aktiengesellschaft**

D - 70435 Stuttgart, Grenzstraße 7  
☎ +49 (0711) 82 01-0, Fax +49 (0711) 82 01-720  
Internet: <http://www.LTG-AG.de>  
E-Mail: [info@LTG-AG.de](mailto:info@LTG-AG.de)

### **LTG Incorporated**

105 Corporate Drive, Suite E  
Spartanburg S.C., 29303 USA  
☎ +1 (864) 599-6340, Fax +1 (864) 599-6344  
Internet: <http://www.LTG-INC.net>  
E-Mail: [info@LTG-INC.net](mailto:info@LTG-INC.net)

### **LTG S.r.l. con socio unico**

Via G. Leopardi 10  
I-20066 Melzo  
☎ +39 (02) 9 55 05 35, Fax +39 (02) 9 55 08 28  
Internet: <http://www.LTG-SRL.com>  
E-Mail: [ltg@ltsrl.191.it](mailto:ltg@ltsrl.191.it)

## Components for Room Air Technology

### Germany

#### Central Office (Frankfurt)

Sales area:

**PLZ 54, 55, 60, 63, 64, 66-69, 97**  
 Sontraer Str. 27  
 D-60386 Frankfurt am Main  
 ☎ (069) 94 20 19-14, Fax -10  
 E-mail: Bergmann@LTG-AG.de

#### Central office (Herborn)

Sales area:

**PLZ 30, 31, 34-38, 56, 57, 61, 65**  
 Sperberweg 16  
 D-35745 Herborn  
 Herr Hartmann  
 ☎ (02772) 570-725, Fax -727  
 E-mail: Hartmann@LTG-AG.de

#### Eastern office (Berlin)

Sales area:

**PLZ 10-25, 29, 39**  
 Eisenhutweg 51a  
 D-12487 Berlin  
 Herr Linke  
 ☎ (030) 63 22 87-74, Fax -75  
 E-mail: Linke@LTG-AG.de

#### Eastern office (Chemnitz)

Sales area:

**PLZ 01-09, 98, 99**  
 Johannes-Ebert-Straße 20  
 D-09128 Chemnitz  
 Herr Schenfeld  
 ☎ (0371) 77118-01, Fax -02  
 E-mail: Schenfeld@LTG-AG.de

#### Southern office

Sales area:

**PLZ 70-96**  
 Grenzstraße 7  
 D-70435 Stuttgart  
 Herr Gau  
 ☎ (0711) 8201-209, Fax -210  
 E-mail: Gau@LTG-AG.de

#### Western office

Sales area:

**PLZ 26-28, 32, 33, 40-53, 58-59**  
 Baststraße 30  
 D-46119 Oberhausen/Rheinl.  
 Herr Perenz  
 ☎ (0208) 30431-55, Fax -56  
 E-mail: Perenz@LTG-AG.de

### Austria

#### **KTG Klimatechnische Gesellschaft mbH**

Schubertstraße 13, A-2126 Ladendorf  
 ☎ (02575) 21089, Fax (02575) 21022  
 E-Mail: office@ktg-wien.com

### Great Britain

#### **MAP**

#### **Motorised Air Products Ltd.**

Unit 5A, Sopwith Crescent  
 Wickford Business Park Wickford  
 GB-Essex SS11 8YU  
 ☎ (01268) 57 44 42, Fax (01268) 57 44 43  
 E-Mail: info@mapuk.com

### Netherlands

#### **Opticlima Systems b.v.**

Leeuwerikstraat 110, NL-3853 AG Ermelo  
 ☎ (0341) 493969, Fax (0341) 493931  
 E-Mail: info@opticlimate.nl

### Poland

#### **HTK Went Sp.z.o.o.**

ul. Chopina 13/3, PL-30047 Krakow  
 ☎ (012 ) 632 31 32, Fax (012) 632 81 93  
 E-Mail: info@htk-went.pl

### Portugal

#### **ArGelo S. A.**

R. Luis Pastor de Macedo, Lote 28 B  
 P-1750-158 Lisboa  
 ☎ (21) 752 01 20, Fax (21) 752 01 29  
 E-Mail: info@argelo.pt

### Slovenia

#### **Systemair Energo Plus d.o.o.**

Koprska 108 d, SLO- 1000 Ljubljana  
 ☎ (01) 200 73 67, Fax (01) 42 33 346  
 E-Mail: info@energoplus.si

### Switzerland

#### **Laminair AG**

Kirchbergstrasse 105  
 Ch-3400 Burgdorf  
 ☎ (034) 420 02-10, (034) 420 02-11  
 E-Mail: info@laminair.ch

### Turkey

#### **Step Müh. Yapi Ltd.**

Barbaros Mah., Kayacan Sokak No. 10  
 TR- 34746 Yenisahra-Atasehir-Istanbul  
 ☎ (0216) 470 0070, Fax (0216) 470 0525  
 E-Mail: info@stepyapi.com.tr

## The Program for Room Air Technology

### Components

Air diffusers for walls, floors and ceilings · LTG System clean<sup>®</sup> · linear diffusers Coandatrol<sup>®</sup> · ceiling air diffusers Coadavent<sup>®</sup> · displacement diffusers · LTG chilling fans cool wave<sup>®</sup> · induction units Klimavent<sup>®</sup> · fan coil units Raumluft · ceiling fan coil units Ventotel<sup>®</sup> · facade fan coil units · airflow control units · labair<sup>®</sup> system

### Engineering services

Technical services for investors, architects, engineers and plant builders during design, construction and operation of buildings. Reliable and precise data relating to the ventilation of air conditioning system are given already before realization of the project, determined by measurements, calculations, building simulations and experiments.

## Components for Process Air Technology

### Japan

#### **Toho Engineering Co. Ltd.**

14-11, Shimizu 3-Chome, Kita Ku  
 Japan 462 Nagoya  
 ☎ (052) 9 91-10 40, Fax (052) 9 14-98 22  
 E-Mail: main@tohoeng.com

## The Program for Process Air Technology

### Components

Axial-flow, centrifugal and tangential fans · Collector system for: coarse and fine particle filtration, separating and compacting, compressing and humidifying.

### Engineering services

Technical services for construction engineers and plant designers during development and operation of assembly groups, machines and plants.

## Highly-Tight Shut-Off Damper Type AKD

### Application

- Shutting off individual or several air ducts.
- Shutting off different room classes.
- Tightly shutting off fume hoods, labs, etc.

### Advantages

- Shut damper leakage meeting DIN EN 1751 Class 4 requirements
- Low noise
- Low pressure losses with the damper open
- Easy installation (LD plug-in system)

### Range of Products

- Standard version with housing and damper blade of galvanized sheet steel; EPDM seal; bars and lever of stainless steel (No. 1.4301); plastic bearing (PPO, POM)
- Version offering increased corrosion protection, powder coated (housing and blade)

Manual, electric, or pneumatic actuator, to choice; nominal diameter 125 - 300 mm.

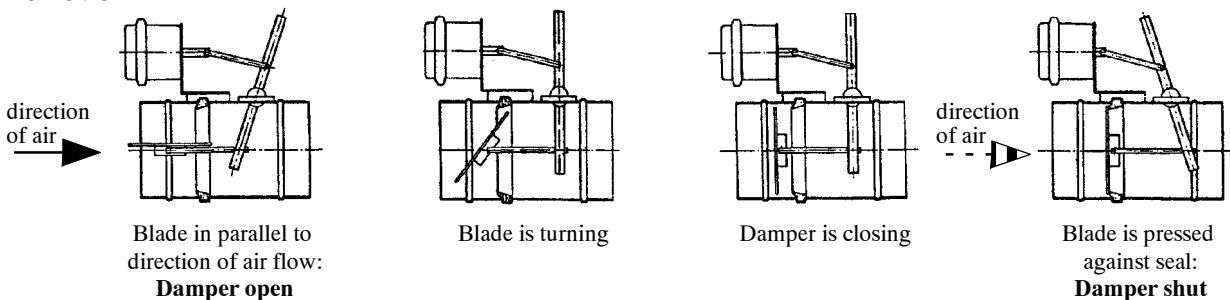


Figure: Ultra-tight Shut-off Damper AKD

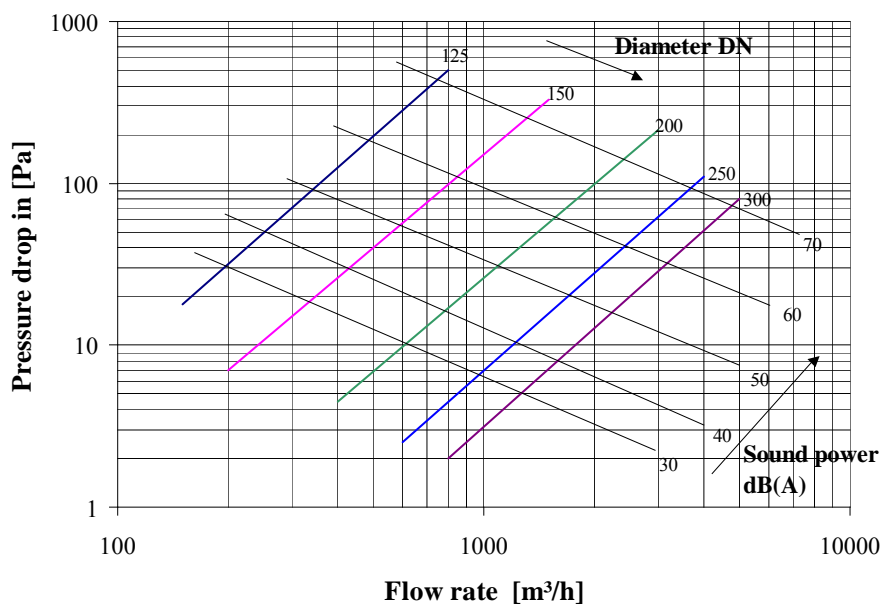
You will find the actual **tender documentations** at the end of this document.

They are available in word format at your local dealership or at [www.LTG-AG.de](http://www.LTG-AG.de).

### Function



### Selection



## Highly-Tight Shut-Off Damper Type AKD

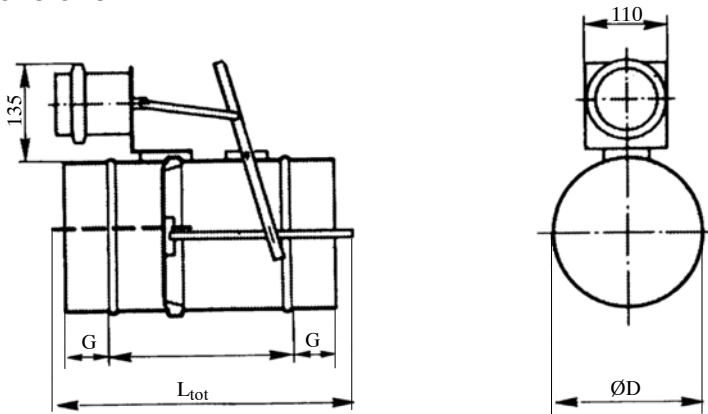
### Technical Specifications

Nominal size = inner $\varnothing$ D [mm]	max. flow rate $V_{\max}$ [m <sup>3</sup> /h]	Pressure difference open damper $\Delta p^*$ [Pa]	max. admissible diff. pressure when opening the damper $\Delta p_{\max}^*$ [Pa]	Sound pressure level open damper $L_{A18}^{**}$ [dB(A)]
125	700	360	2000	64
150	1000	180		61
200	2000	110		61
250	3300	85		64
300	5000	80		66

\* Higher  $\Delta p_{\max}$  possible on demand

\*\* Sound power level  $L_{wA}$  [dB] = Sound pressure level  $L_{A18}$  [dB] + 6

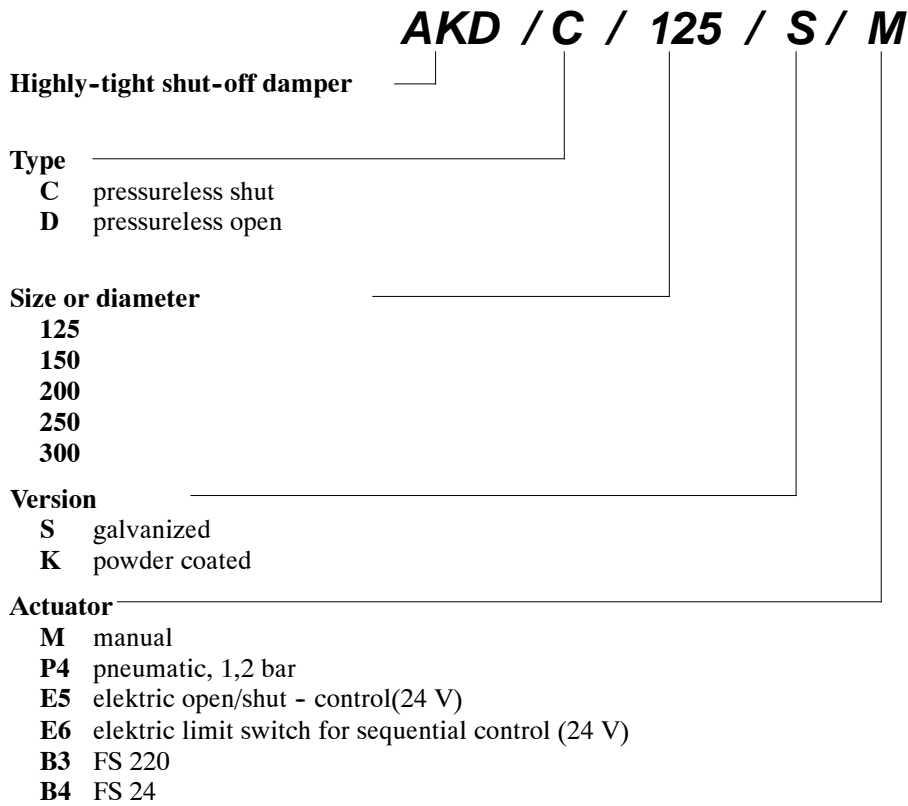
### Dimensions



Nominal size = inner $\varnothing$ D [mm]	L [mm]	G [mm]	$L_{\text{tot}}$ [mm]	Mass [kg]
125	188	40	268	2.3
150	199	40	291	2.5
200	242	60	377	3.5
250	274	60	486	4.6
300	304	60	550	5.5

## Highly-Tight Shut-Off Damper Type AKD

### Nomenclature



## Highly-Tight Shut-Off Damper Type KLB

### Function

The KLB highly-tight shut-off damper is designed to hermetically shut off air flow. The leakage air rate is too low to be reported when tested to DIN 1946 Page 4.

A near perfect isolation is achieved using a "positive seal" technique whereby the blade rotates and then closes onto a peripheral seal.

For this purpose a 4-joint link mechanism is used that, from the open position, first rotates the blade by 90°, then after a translation movement pushes it in a longitudinal direction onto the damper housing against a sealing ring. The fully welded damper housing is penetrated only by two pivot shafts.

### Range of Products

The highly-tight shut-off damper type KLB is available in a round version with nominal sizes 224 to 800 mm diameter.

The standard version is made of galvanized steel. A special version is available made of a V2A stainless steel especially for applications that require disinfection.

Also available with manual operator, pneumatic or electric actuator.

If required, the electric actuator may be equipped with a position switch to indicate the open or closed position.

### Application / Advantages

- highly-tight shut-off damper type KLB meets highest isolation/sanitation requirements, e.g. in cleanrooms, hospitals, labs, fume cabinets etc.
- With increasing pressure the damper seal is more effective.

### Leak Test Procedure

With the damper blade closed the housing is subjected to a positive pressure of 500 Pa. Bearings and connections are covered with a test liquid in order to disclose leakage points. The blade is then repeatedly opened and closed. Again using a pressure of 500 Pa, the closed blade's sealing effectiveness is checked. No bubble formation is allowed. The two procedures are repeated with a pressure of 100 Pa. Each damper is tested individually (100%). On request, tests may be performed in compliance with relevant standards.



Figure: Highly-tight Shut-Off Damper Type KLB

### Permissible differential pressures when opening the damper with air motor SMC

If the highly-tight shut-off damper type KLB is to be re-opened after closing the differential pressure present at the closed damper may not exceed the maximum differential pressure [Pa] shown in Table 1 to ensure that there is sufficient power to open the damper.

Allowed differential pressures for electric actuators on request.

If the actual differential pressures are higher than the ones given in Table 1 a twin actuator may be used so that the maximum permissible differential pressures may be 1.8 times the values given in the chart.

You will find the actual **tender documentations** at the end of this document.

They are available in word format at your local dealership or at [www.LTG-AG.de](http://www.LTG-AG.de).

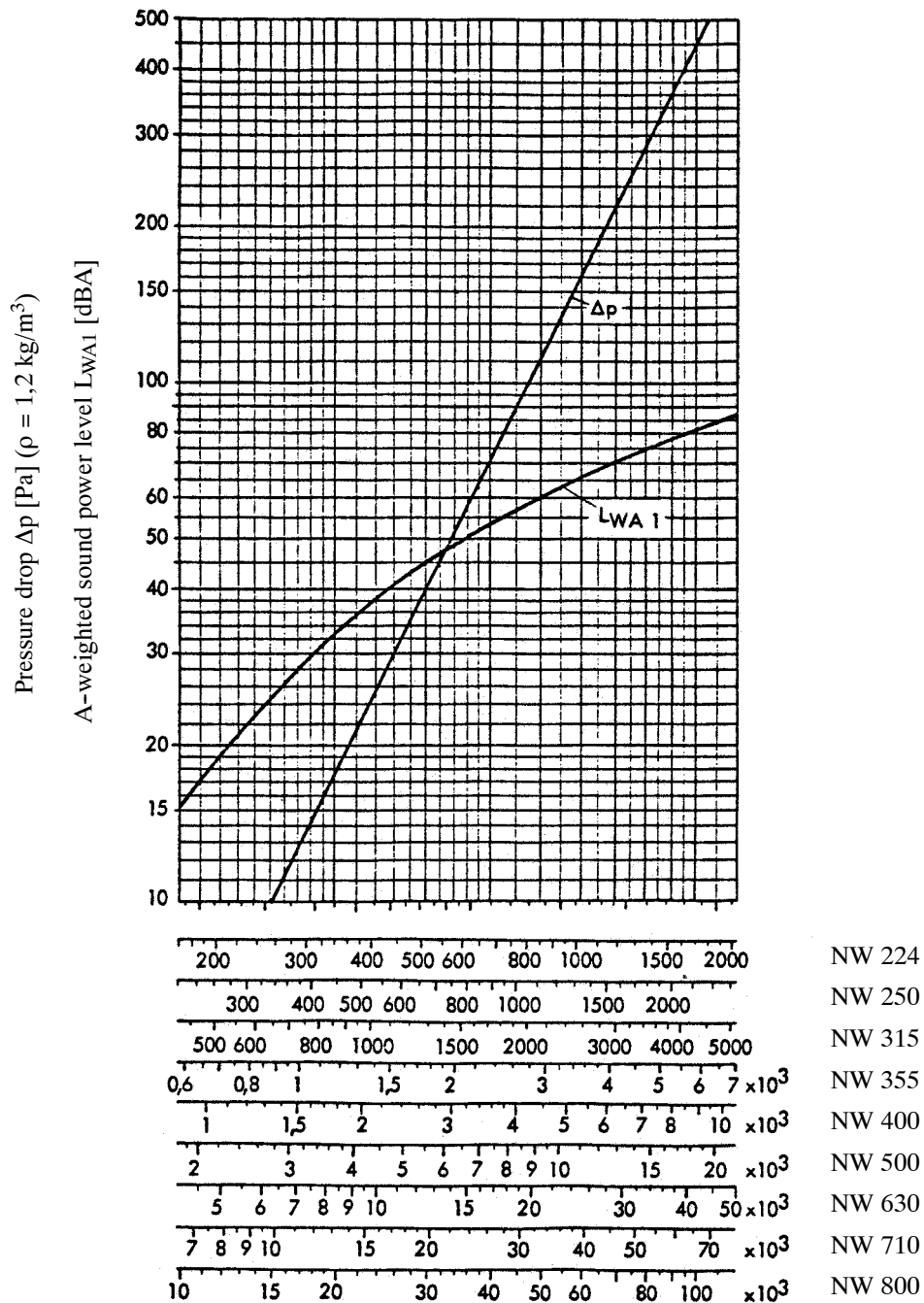
Size NW	maximum differential pressure across damper at various actuator pneumatic pressures		
	1,2 bar or function "pressureless open"	1.5 bar	1.7 bar
<b>224</b>	14 000	17 000	19 000
<b>250</b>	11 000	13 700	14 900
<b>315</b>	6 000	7 500	8 100
<b>355</b>	4 400	5 500	5 900
<b>400</b>	3 200	4 000	4 300
<b>500</b>	1 300	1 600	1 700
<b>630</b>	1 900	2 300	2 500
<b>710</b>	1 300	1 600	1 700
<b>800</b>	1 000	1 200	1 300

Table 1  
Maximum permissible differential pressures [Pa]  
when opening the damper.

## Highly-Tight Shut-Off Damper Type KLB

### Technical Specifications

The diagram shows the pressure drop and the sound power produced by air-flow through the damper with the blade in the open position.

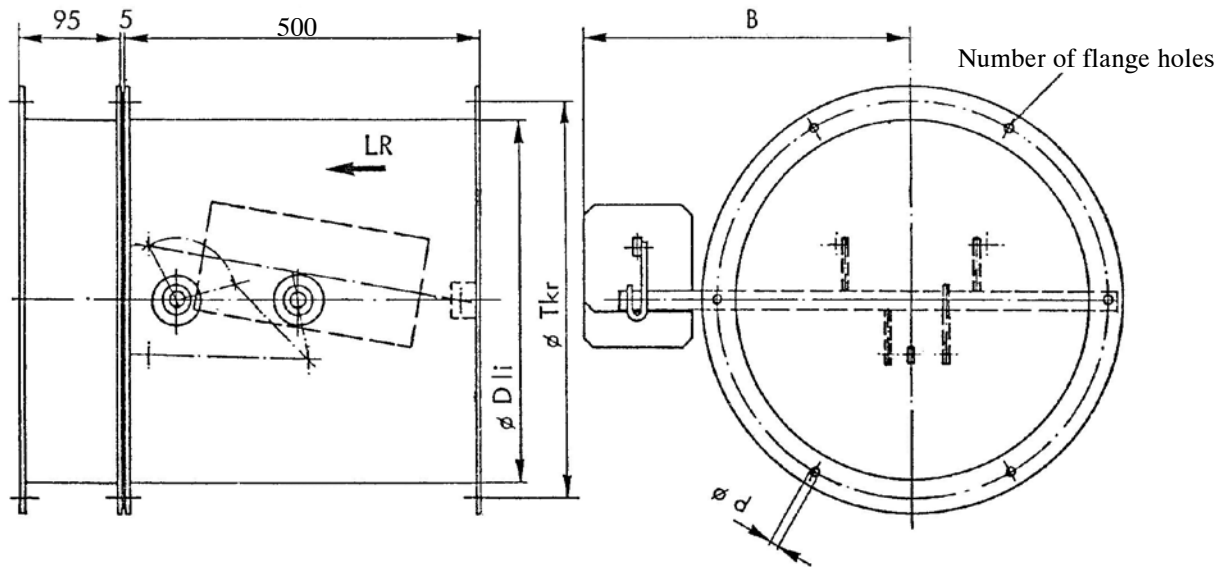


Determination of the A-weighted sound power level for various nominal sizes of the highly-tight shut-off damper. In the present data sheet  $L_{WA1}$  is the A-weighted sound power level for shut-off damper size 400. For the other nominal sizes, the following corrections to the diagram values must be applied:  $K = L_{WA} - L_{WA1}$

Size NW	224	250	315	355	400	500	630	710	800
K [dB]	-8	-7	-4,5	-3	0	+8	+19	+24	+29

## Highly-Tight Shut-Off Damper Type KLB

### Dimensions



for sizes over 630 damper has two pneumatic actuators type SMC1

Size NW	Galvanized steel Ident. No.	V2A Ident. No.	Inside diam. D [mm]	Reference diameter [mm]	Number of holes	Hole diameter [mm]	Flange size	Weight [kg]
224	102434	25597.8	229	259	6	7	25x4	12.7
250	102426	25598.6	256	286	6	7	25x4	13.5
315	102418	25599.4	322	356	8	10	30x4	15.9
355	102400	25600.9	361	395	8	10	30x4	17.3
400	102393	25601.7	404	438	12	10	30x4	18.9
500	102369	25602.5	507	541	12	10	30x4	23.0
630	102351	25603.3	638	674	16	12	35x6	41.3
710	102343	25604.1	715	751	16	12	35x6	46.0
800	102335	25605.9	801	837	24	12	35x6	51.0

### Installation/Assembly

Perform duct installation of the highly-tight shut-off damper type KLB with the damper axis in a horizontal position. Any other installation will require LTG Aktiengesellschaft's express permission.

## Highly-Tight Shut-Off Damper Type KLB

### Nomenclature

**KLB ... / - / -**

Highly-tight shut-off damper,  
 round

Model size or diameter

224  
 250  
 315  
 355  
 400  
 500  
 630  
 710  
 800

Version

S: steel, galvanized  
 E: stainless steel V2A (1.4301)  
 F: stainless steel V4A (1.4571)

Actuator

without  
 M: manual adjustment (quadrant)  
 P: pneumatic actuator SMC 1  
 B: Belimo spring return or ON/OFF actuator

## Specification and Schedule of Prices

### Highly-tight Shut-Off Damper AKD

Edition 10.7.2008

Qty.	Description	Unit price in €	Total price in €
	<p>The ultra-tight shut-off damper type AKD serves to virtually hermetically shut off an air flow. It meets DIN EN 1751 Class 4 requirements. The leakage air rate is too low to be reported when tested. A near perfect isolation is achieved using a "positive seal" technique whereby the blade rotates and then closes onto a peripheral seal. For this purpose a 4-joint link mechanism is used that, from the open position, first rotates the blade by 90°, then after a translation movement pushes it in a longitudinal direction onto the damper housing against a sealing ring.</p> <p><u>Shut-off damper AKD consisting of:</u> Housing and damper blade of galvanized sheet steel. Rods and damper axle of V2A stainless steel. Damper bearing maintenance-free in plastic bushing. EPDM seal, formaldehyde resistant. Maximum operating temperature: 90 °C</p> <p><b>Sizes Ø:</b></p> <ul style="list-style-type: none"> <li>o 125 mm</li> <li>o 150 mm</li> <li>o 200 mm</li> <li>o 250 mm</li> <li>o 300 mm</li> </ul> <p><b>Manufacturer: LTG Aktiengesellschaft</b> <b>Type: AKD</b></p> <p><b>Accessories/special equipment</b> (optional, additional charge):</p> <ul style="list-style-type: none"> <li>o Powder coated corrosion protected version</li> <li>o Pneumatic actuator LTG type type SMA 1 (0.2 – 1.0 bar)</li> <li>o Electric actuator brand/type: _____</li> <li>o Manual adjustment</li> </ul>		

## Specification and Schedule of Prices

### Highly-tight Shut-Off Damper KLB

Edition 10.7.2008

Qty.	Description	Unit price in €	Total price in €
	<p>The highly-tight shut-off damper type KLB is designed to hermetically shut off air-flow. The leakage air rate is too low to be reported when tested. A near perfect isolation is achieved using a "positive seal" technique whereby the blade rotates and then closes onto a peripheral seal. For this purpose a 4-joint link mechanism is used that, from the open position, first rotates the blade by 90°, then after a translation movement pushes it in a longitudinal direction onto the damper housing against a sealing ring. Each damper is individually leak tested and can be rated to other relevant standards.</p> <p><u>Damper KLB consisting of:</u> Housing of 1.5 mm galvanized sheet steel with welded flanges according to DIN 24154 Series 3. Rotating damper parts are made from stainless steel V2A. The primary drive shaft penetration of the case is sealed using a gland ring. Damper bearing maintenance-free bronze bushings with PTFE seals. Gasket of EPDM, formaldehyde-resistant.</p> <p><b>Model sizes Ø:</b></p> <ul style="list-style-type: none"> <li>o 224 mm</li> <li>o 250 mm</li> <li>o 315 mm</li> <li>o 355 mm</li> <li>o 400 mm</li> <li>o 500 mm</li> <li>o 630 mm</li> <li>o 710 mm</li> <li>o 800 mm</li> </ul> <p><b>Manufacturer: LTG Aktiengesellschaft</b> <b>Type: KLB</b></p> <p><b>Accessories/special equipment</b> (optional, additional charge):</p> <ul style="list-style-type: none"> <li>o stainless steel version V2A (material 1.4301)</li> <li>o stainless steel version V4A (material 1.4571)</li> <li>o pneumatic actuator LTG type SMC 1</li> <li>o electric actuator brand/type: _____</li> <li>o manual adjustment</li> </ul>		