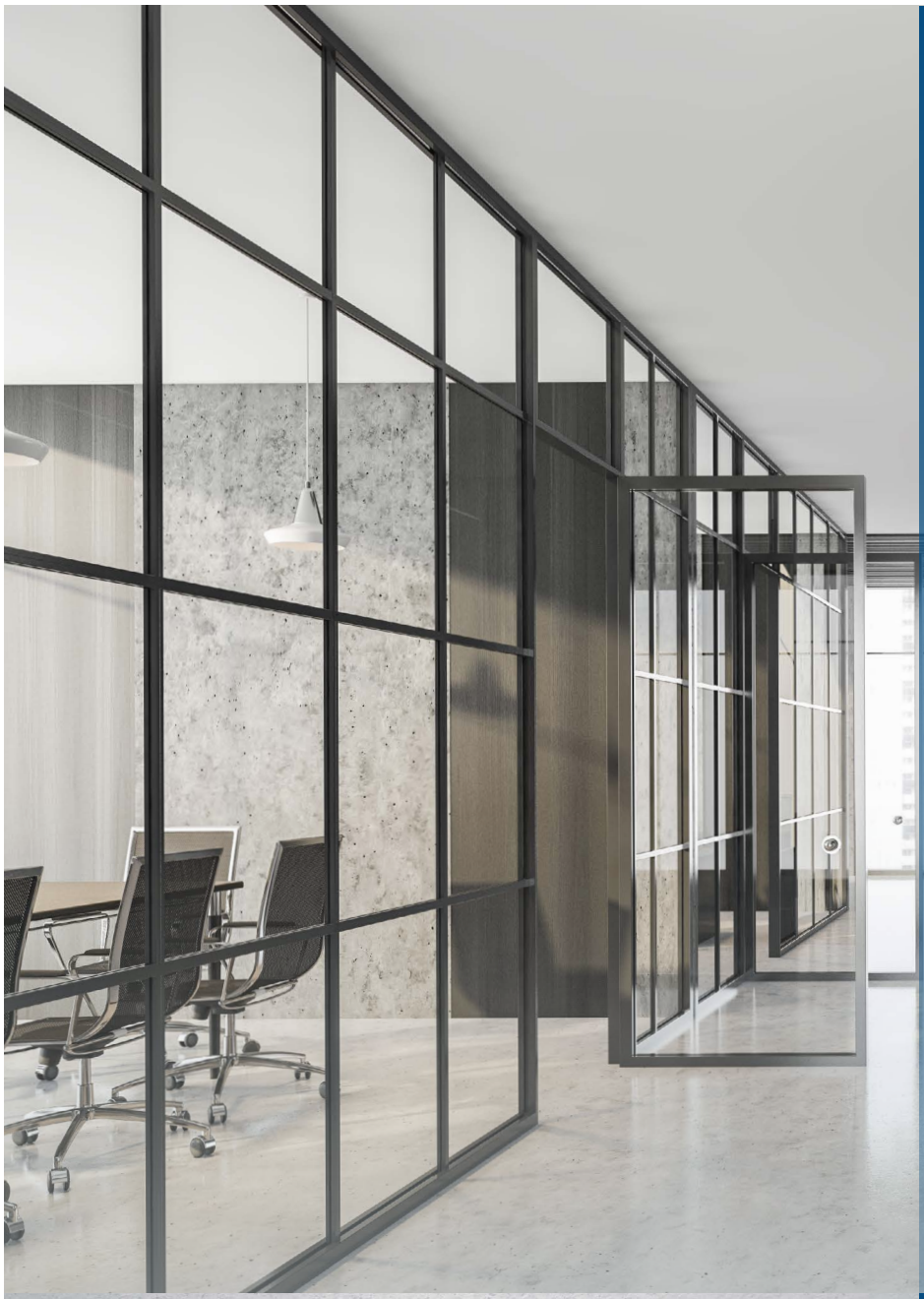
komfovent



VARIABLE AIR VOLUME DAMPERS

Precise air volume control by demand

Content

Description

VARIABLE AIR VOLUME DAMPER

- Suitable for the control of air volume flow rate, room pressure, or duct pressure.
- Dynamic or Static differential pressure measurement principle available.
- Effective flow measurement design to ensure the highest precision of readings.
- Available circular dimensions: Ø100-630 mm.
- Available rectangular dimensions: 200×100 to 1000×1000 mm, step 100 mm.
- Airflow speed measurement from 0.3 m/sec.
- Closed blade air leakage class up to 3 (on request class 4) according to EN 1751.
- Casing air leakage class up to C according to EN 1751.
- Controller preset in-factory.
- Belimo or Siemens actuators available.
- Analog, MP-bus, Modbus, BACnet, and KNX communication protocols.
- Simple adjustment of settings with ZTH or PC tool for Belimo, AST20, ACS931/ACS941 for Siemens actuators.
- An insulated model is available for sound attenuation through the case.
- Different duct & room sensors and controllers are available as accessories: CO_2, T, RH, VOC, etc.
- Various scenarios for different VAV dampers' application are available.

Circular air volume regulation damper KOS-C

Rectangular air volume regulation damper KOS-R

KOS-C and KOS-R is an air flow regulator for variable air volume (VAV) regulation in duct systems. Damper consists of blade, measuring unit and controller. Damper is fitted with a differential pressure sensors for measuring the volume flow rate. The flow regulation can be controlled from room controller or BMS system.

The VAV damper from KOMFOVENT has a unique solution. The measuring pressure tubes inside of the damper are of a unique shape that provides the best results and accurate flow measurement also on lower airflow speeds according to the study and research made. For circular VAV damper, KOS-C, recommended minimal airflow is 0.7 m/s with laboratory tested deviation up to 9 %, however for air velocities from 1 m/s to 10 m/s guaranteed deviation doesn't exceed 5 %. It's one of the best air velocity measurement precessions in HVAC industry.

Rectangular VAV dampers KOS-R air velocity range starts from 0.8 m/s with a maximal deviation of 10 %.

The damper controller can provide the variable air flow mode where the air flow is regulated in between the values V_{min} and V_{max}. Also the damper controller can provide mode where air flow is kept constant using parameters V_{min}, V_{max}, Open or Closed. The damper can work as a room or duct pressure regulator where volumetric flows are regulated in a range between V_{min} and V_{max} depending on the function of supply air which can be controlled with room or other controller.

The setpoints for V_{min} and V_{max} are preset in factory but can also be readjusted afterwards. Easy adjustments of VAV damper operating values can be made with ZTH service tool and adjustment tool app.

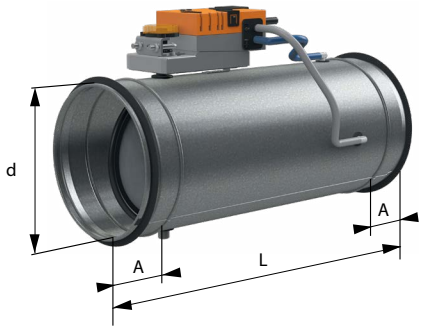
Appropriate air filters must be installed where high air dust pollution is possible as the contamination can negatively impact measurement accuracy.

Size and dimensions

KOS-C damper is available in 12 different sizes.

KOS-C DAMPER

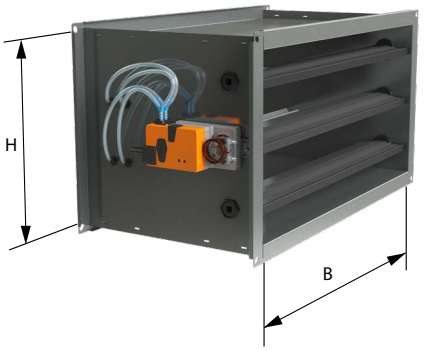
Circular dampers KOS-C available in 12 dimensions: Ø 100-630 mm.



				V_{min}						V_{max} range					
				Belimo BMF…, BMP…, BMD…, BKX			Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…		
d, mm	M, kg	L, mm	A, mm	Q, m³/h	Q, l/s	v, m/s	Q, m³/h	Q, l/s	v, m/s	Q, m³/h	Q, l/s	v, m/s	Q, m³/h	Q, l/s	v, m/s
100	1,3	390	40	20	5	0,7	8	2	0,3	34	9	1,2	367	102	13
125	1,5	390	40	31	9	0,7	13	4	0,3	53	15	1,2	574	159	13
160	1,8	390	40	51	14	0,7	22	6	0,3	87	24	1,2	940	261	13
200	2,2	390	40	79	22	0,7	34	9	0,3	136	38	1,2	1470	408	13
250	3,5	592	40	124	34	0,7	53	15	0,3	212	59	1,2	2296	638	13
315	4,5	592	40	196	55	0,7	84	23	0,3	336	93	1,2	3645	1013	13
355	8,8	600	65	249	69	0,7	107	30	0,3	427	119	1,2	4630	1286	13
400	10	600	65	317	88	0,7	136	38	0,3	543	151	1,2	5878	1633	13
450	12,3	675	65	401	111	0,7	172	48	0,3	687	191	1,2	7439	2067	13
500	15	750	65	495	137	0,7	212	59	0,3	848	236	1,2	9185	2551	13
560	20,8	791	65	620	172	0,7	266	74	0,3	1063	295	1,2	11521	3200	13
630	27,5	791	65	785	218	0,7	336	93	0,3	1346	374	1,2	14581	4050	13

KOS-R DAMPER

Available dimensions of rectangular dampers KOS-R: from 200×100 to 1000×1000 mm, when the size of the "step" is 100 mm.



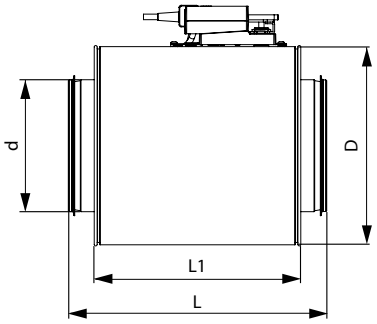
			V_{min}						V_{max} range					
			Belimo BMF…, BMP…, BMD…, BKX			Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…		
B, mm	H, mm	M, kg	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s
200	100	3,3	58	16	0,8	58	16	0,8	86	24	1,2	936	260	13
300	100	4,5	86	24	0,8	86	24	0,8	130	36	1,2	1404	390	13
400	100	5,3	115	32	0,8	115	32	0,8	173	48	1,2	1872	520	13
200	200	4,1	115	32	0,8	115	32	0,8	173	48	1,2	1872	520	13
300	200	5,1	173	48	0,8	173	48	0,8	259	72	1,2	2808	780	13
400	200	6	230	64	0,8	230	64	0,8	346	96	1,2	3744	1040	13
500	200	7,3	288	80	0,8	288	80	0,8	432	120	1,2	4680	1300	13
600	200	8,1	346	96	0,8	346	96	0,8	518	144	1,2	5616	1560	13
300	300	6,5	259	72	0,8	259	72	0,8	389	108	1,2	4212	1170	13
400	300	7,4	346	96	0,8	346	96	0,8	518	144	1,2	5616	1560	13
500	300	8,4	432	120	0,8	432	120	0,8	648	180	1,2	7020	1950	13
600	300	9,4	518	144	0,8	518	144	0,8	778	216	1,2	8424	2340	13
700	300	10	605	168	0,8	605	168	0,8	907	252	1,2	9828	2730	13
800	300	11	691	192	0,8	691	192	0,8	1037	288	1,2	11232	3120	13
900	300	12	778	216	0,8	778	216	0,8	1166	324	1,2	12636	3510	13
1000	300	13,3	864	240	0,8	864	240	0,8	1296	360	1,2	14040	3900	13
400	400	8,5	461	128	0,8	461	128	0,8	691	192	1,2	7488	2080	13
500	400	9,5	576	160	0,8	576	160	0,8	864	240	1,2	9360	2600	13
600	400	11	691	192	0,8	691	192	0,8	1037	288	1,2	11232	3120	13
700	400	12	806	224	0,8	806	224	0,8	1210	336	1,2	13104	3640	13
800	400	13	922	256	0,8	922	256	0,8	1382	384	1,2	14976	4160	13
900	400	14	1037	288	0,8	1037	288	0,8	1555	432	1,2	16848	4680	13
1000	400	14,8	1152	320	0,8	1152	320	0,8	1728	480	1,2	18720	5200	13

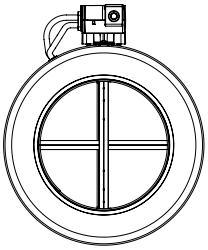
			V_{min}						V_{max} range					
			Belimo BMF…, BMP…, BMD…, BKX			Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…		
B, mm	H, mm	M, kg	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s
500	500	11	720	200	0,8	720	200	0,8	1080	300	1,2	11700	3250	13
600	500	12	864	240	0,8	864	240	0,8	1296	360	1,2	14040	3900	13
700	500	13	1008	280	0,8	1008	280	0,8	1512	420	1,2	16380	4550	13
800	500	14	1152	320	0,8	1152	320	0,8	1728	480	1,2	18720	5200	13
900	500	15	1296	360	0,8	1296	360	0,8	1944	540	1,2	21060	5850	13
1000	500	16,4	1440	400	0,8	1440	400	0,8	2160	600	1,2	23400	6500	13
600	600	13	1037	288	0,8	1037	288	0,8	1555	432	1,2	16848	4680	13
700	600	14	1210	336	0,8	1210	336	0,8	1814	504	1,2	19656	5460	13
800	600	16	1382	384	0,8	1382	384	0,8	2074	576	1,2	22464	6240	13
900	600	17	1555	432	0,8	1555	432	0,8	2333	648	1,2	25272	7020	13
1000	600	17,9	1728	480	0,8	1728	480	0,8	2592	720	1,2	28080	7800	13
700	700	14	1411	392	0,8	1411	392	0,8	2117	588	1,2	22932	6370	13
800	700	17	1613	448	0,8	1613	448	0,8	2419	672	1,2	26208	7280	13
900	700	18	1814	504	0,8	1814	504	0,8	2722	756	1,2	29484	8190	13
1000	700	19,5	2016	560	0,8	2016	560	0,8	3024	840	1,2	32760	9100	13
800	800	18	1843	512	0,8	1843	512	0,8	2765	768	1,2	29952	8320	13
900	800	20	2074	576	0,8	2074	576	0,8	3110	864	1,2	33696	9360	13
1000	800	21,1	2304	640	0,8	2304	640	0,8	3456	960	1,2	37440	10400	13
900	900	21	2333	648	0,8	2333	648	0,8	3499	972	1,2	37908	10530	13
1000	900	22,6	2592	720	0,8	2592	720	0,8	3888	1080	1,2	42120	11700	13
1000	1000	24,2	2880	800	0,8	2880	800	0,8	4320	1200	1,2	46800	13000	13

KOS-C-I DAMPER

An insulated damper version KOS-C-I is available to reduce the possible radiated noise through the case.

The insulation is made from 50 mm thick mineral wool ISOVER KT-40 that is covered with a metal sheet made from zinc coated galvanized steel. ISOVER KT-40 fire resistance is classified as A1 in accordance with EN 13501.



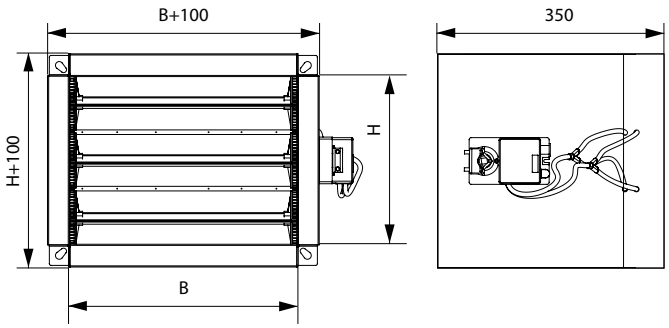


					V_{min}						V_{max} range					
					Belimo BMF…, BMP…, BMD…, BKX			Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…		
d, mm	D, mm	M, kg	L, mm	L1, mm	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s
100	199	1,3	390	312	20	5	0,7	8	2	0,3	34	9	1,2	367	102	13
125	224	1,5	390	312	31	9	0,7	13	4	0,3	53	15	1,2	574	159	13
160	259	1,8	390	312	51	14	0,7	22	6	0,3	87	24	1,2	940	261	13
200	299	2,2	390	312	79	22	0,7	34	9	0,3	136	38	1,2	1470	408	13
250	349	3,5	592	514	124	34	0,7	53	15	0,3	212	59	1,2	2296	638	13
315	414	4,5	592	514	196	55	0,7	84	23	0,3	336	93	1,2	3645	1013	13
355	453	8,8	600	480	249	69	0,7	107	30	0,3	427	119	1,2	4630	1286	13
400	498	10	600	480	317	88	0,7	136	38	0,3	543	151	1,2	5878	1633	13
450	548	12,3	675	555	401	111	0,7	172	48	0,3	687	191	1,2	7439	2067	13
500	598	15	750	630	495	137	0,7	212	59	0,3	848	236	1,2	9185	2551	13
560	658	20,8	791	671	620	172	0,7	266	74	0,3	1063	295	1,2	11521	3200	13
630	729	27,5	791	671	785	218	0,7	336	93	0,3	1346	374	1,2	14581	4050	13

There is an option to order the insulated version with outer casing made from stainless steel. KOS-C-I has the following sound insulating capacity R, dBA for required frequency:

Frequency, Hz	63	125	250	500	1000	2000	4000	8000
dB(A)	7	7	14	21	25	28	28	25

KOS-R-I DAMPER



			V_{min}						V_{max} range					
			Belimo BMF…, BMP…, BMD…, BKX			Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…		
B, mm	H, mm	M, kg	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s
200	100	6,5	58	16	0,8	58	16	0,8	86	24	1,2	936	260	13
300	100	7,9	86	24	0,8	86	24	0,8	130	36	1,2	1404	390	13
400	100	9,3	115	32	0,8	115	32	0,8	173	48	1,2	1872	520	13
200	200	8,0	115	32	0,8	115	32	0,8	173	48	1,2	1872	520	13
300	200	9,5	173	48	0,8	173	48	0,8	259	72	1,2	2808	780	13
400	200	11,0	230	64	0,8	230	64	0,8	346	96	1,2	3744	1040	13
500	200	13,0	288	80	0,8	288	80	0,8	432	120	1,2	4680	1300	13
600	200	14,0	346	96	0,8	346	96	0,8	518	144	1,2	5616	1560	13
300	300	11,0	259	72	0,8	259	72	0,8	389	108	1,2	4212	1170	13
400	300	13,0	346	96	0,8	346	96	0,8	518	144	1,2	5616	1560	13
500	300	14,0	432	120	0,8	432	120	0,8	648	180	1,2	7020	1950	13
600	300	16,0	518	144	0,8	518	144	0,8	778	216	1,2	8424	2340	13
700	300	17,0	605	168	0,8	605	168	0,8	907	252	1,2	9828	2730	13
800	300	19,0	691	192	0,8	691	192	0,8	1037	288	1,2	11232	3120	13
900	300	21,0	778	216	0,8	778	216	0,8	1166	324	1,2	12636	3510	13
1000	300	22,2	864	240	0,8	864	240	0,8	1296	360	1,2	14040	3900	13
400	400	14,0	461	128	0,8	461	128	0,8	691	192	1,2	7488	2080	13
500	400	16,0	576	160	0,8	576	160	0,8	864	240	1,2	9360	2600	13
600	400	18,0	691	192	0,8	691	192	0,8	1037	288	1,2	11232	3120	13
700	400	19,0	806	224	0,8	806	224	0,8	1210	336	1,2	13104	3640	13
800	400	21,0	922	256	0,8	922	256	0,8	1382	384	1,2	14976	4160	13
900	400	23,0	1037	288	0,8	1037	288	0,8	1555	432	1,2	16848	4680	13
1000	400	24,3	1152	320	0,8	1152	320	0,8	1728	480	1,2	18720	5200	13

			V_{min}						V_{max} range					
			Belimo BMF…, BMP…, BMD…, BKX			Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…			Belimo BMF…, BMP…, BMD…, BKX / Siemens SMF…, SMD…, SKX…		
B, mm	H, mm	M, kg	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s	Q, m^3/h	Q, l/s	v, m/s
500	500	18,0	720	200	0,8	720	200	0,8	1080	300	1,2	11700	3250	13
600	500	19,0	864	240	0,8	864	240	0,8	1296	360	1,2	14040	3900	13
700	500	21,0	1008	280	0,8	1008	280	0,8	1512	420	1,2	16380	4550	13
800	500	23,0	1152	320	0,8	1152	320	0,8	1728	480	1,2	18720	5200	13
900	500	25,0	1296	360	0,8	1296	360	0,8	1944	540	1,2	21060	5850	13
1000	500	26,5	1440	400	0,8	1440	400	0,8	2160	600	1,2	23400	6500	13
600	600	21,0	1037	288	0,8	1037	288	0,8	1555	4326	1,2	16848	4680	13
700	600	23,0	1210	336	0,8	1210	336	0,8	1814	504	1,2	19656	5460	13
800	600	25,0	1382	384	0,8	1382	384	0,8	2074	576	1,2	22464	6240	13
900	600	27,0	1555	432	0,8	1555	432	0,8	2333	648	1,2	25272	7020	13
1000	600	28,6	1728	480	0,8	1728	480	0,8	2592	720	1,2	28080	7800	13
700	700	25,0	1411	392	0,8	1411	392	0,8	2117	588	1,2	22932	6370	13
800	700	27,0	1613	448	0,8	1613	448	0,8	2419	672	1,2	26208	7280	13
900	700	29,0	1814	504	0,8	1814	504	0,8	2722	756	1,2	29484	8190	13
1000	700	30,8	2016	560	0,8	2016	560	0,8	3024	840	1,2	32760	9100	13
800	800	29,0	1843	512	0,8	1843	512	0,8	2765	768	1,2	29952	8320	13
900	800	31,0	2074	576	0,8	2074	576	0,8	3110	864	1,2	33696	9360	13
1000	800	33,0	2304	640	0,8	2304	640	0,8	3456	960	1,2	37440	10400	13
900	900	33,0	2333	648	0,8	2333	648	0,8	3499	972	1,2	37908	10530	13
1000	900	35,1	2592	720	0,8	2592	720	0,8	3888	1080	1,2	42120	11700	13
1000	1000	37,3	2880	800	0,8	2880	800	0,8	4320	1200	1,2	46800	13000	13

KOS-R-I has the following sound insulating capacity R, dBA for required frequency:

Frequency, Hz	63	125	250	500	1000	2000	4000	8000
dB(A)	7	7	14	21	25	28	28	25

Installation

INSTALLATION INFORMATION AND PRECAUTIONS

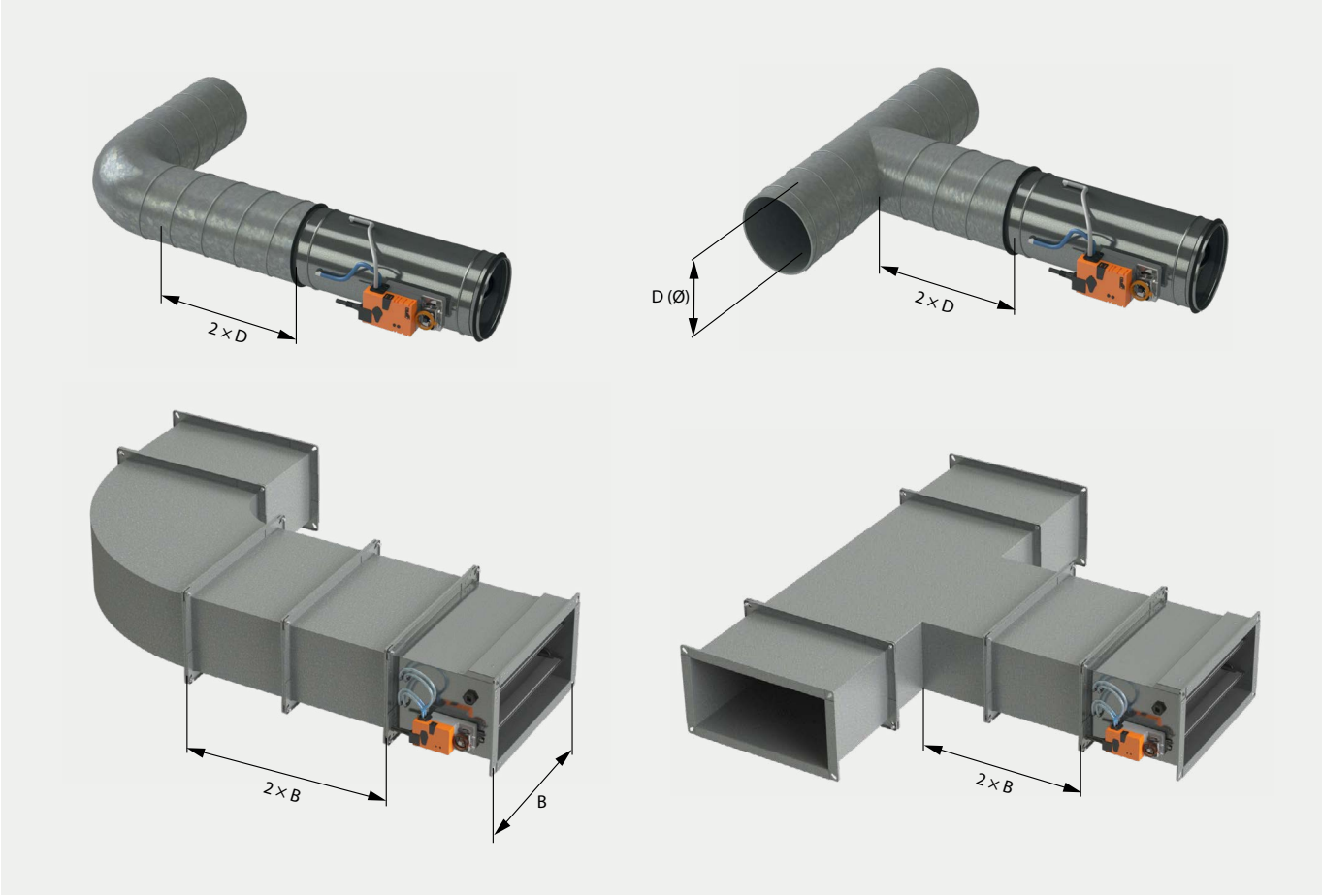
Precautions must be taken into consideration where dampers are installed in places where extreme temperature conditions can be met and condensation can build up inside the duct and thus inside of damper. The condensation and also the large temperature difference between inside and outside air can affect measurement results in a negative way.

To avoid flow measurement deviation and unnecessary errors, the minimum distance before the VAV damper must be observed (see drawings below).

Straight section of duct equal to 2xD (for circular ducts) or 2xB (for rectangular ducts) from 90° bend or T-piece is the minimum requirement when installing dampers.

Using smaller straight section will lead to a bigger flow measurement error. A bigger straight distance is recommended after silencers, fire dampers and other ventilation duct system components.

To achieve the best sound power level, dampers should be connected to the duct with rivets and not the screws. This recommendation also refers to the entire duct system.



Controller connections

Controller connections options

4 controller options are available for KOS damper:

- analogue connection
- MP-bus communication
- Modbus or BACnet communication
- KNX communication

Analogue connection

With analogue connection it is possible to connect controller 0...10 V or 2...10 V to the VAV damper and control the air volume, depending on the given signal and set up.

MP-Bus connection

The MP-Bus is master/slave bus technology where defined number of slaves can be connected to a MP-Master unit. Below is a connection scheme for MP-bus type actuators.

Type	Torque	Power consumption	Rating	Weight
LMV-D3-MF-F	5 Nm	2 W	3.5 VA (max. 8 A @ 5 ms)	Approx. 500 g

VAV – variable operation V_{min}…V_{max}

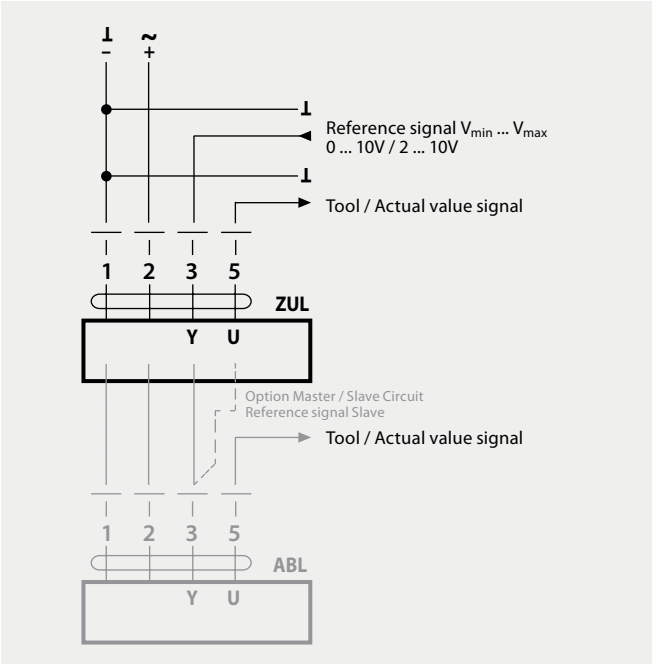
Damper is CLOSED via 0 ... 10 V reference signal (Mode 2 ... 10 V).

Setting parameters: Mode 2 … 10 V, Shut off level 0.1 V or 0.5 V.

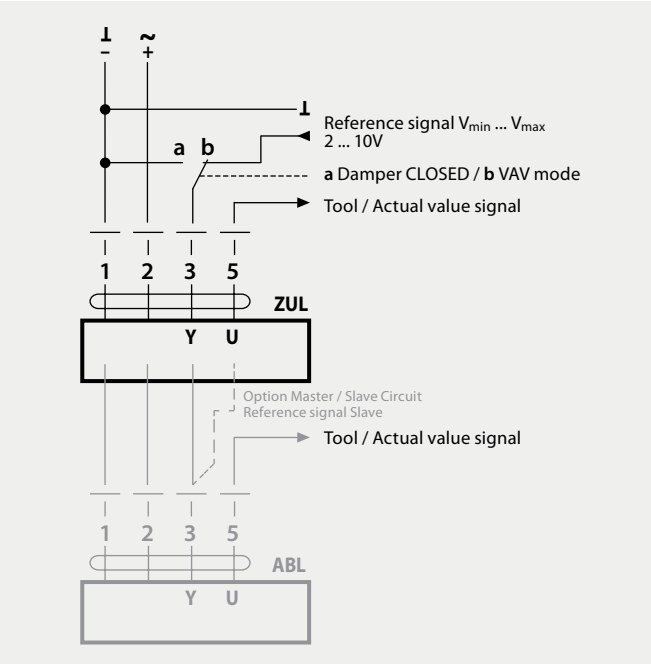
If the required switching threshold of 0.1 V cannot be attained, the value can be switched to 0.5 V with PCTool.

Function	Standard 0.1 V	Shut-off level 0.5 V
Damper CLOSED	<0.1 V	<0.5 V
Vmin	>0.1 ... 2 V	>0.5 V ... 2 V
Vmin ... Vmax	2 ... 10 V	2 ... 10 V

In CAV applications shut-off level must not be set to 0.5 V, otherwise the open connection 3 is interpreted as damper CLOSED.



Wiring diagram 1: VAV, analogue reference signal



Wiring diagram 2: VAV with shut-off (CLOSED), 2 ... 10 V mode

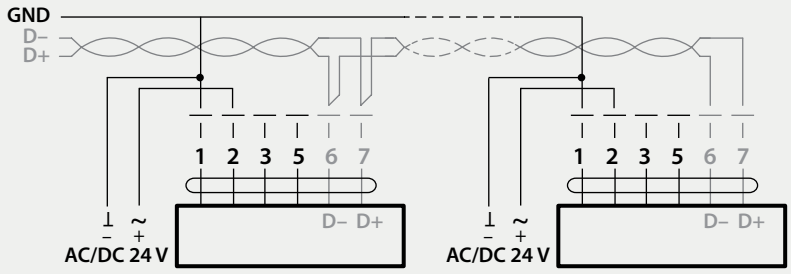
Modbus or BACnet connection

The Modbus protocol is used to establish master-slave / client-server communication between intelligent devices.

Using Modbus, a master (e.g. automation station) and several slaves can be interconnected. Below is a connection scheme for Modbus type actuators.

Type	Torque	Power consumption	Rating	Weight
LMV-D3-MOD	5 Nm	2 W	3.5 VA (max. 8 A @ 5 ms)	Approx. 500 g

Electrical installation



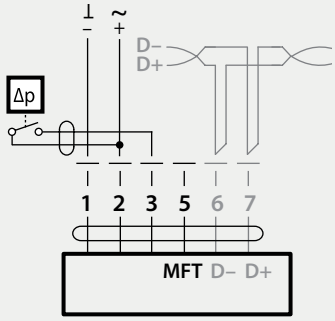
Cable colours:

1 = black
2 = red
3 = white
5 = orange
6 = pink
7 = gray

Signal assignement Modbus:

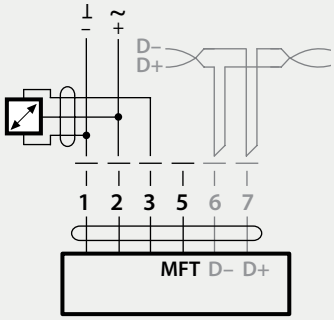
C1 = D– = A
C2 = D+ = A

BACnet MS/TP / Modbus RTU



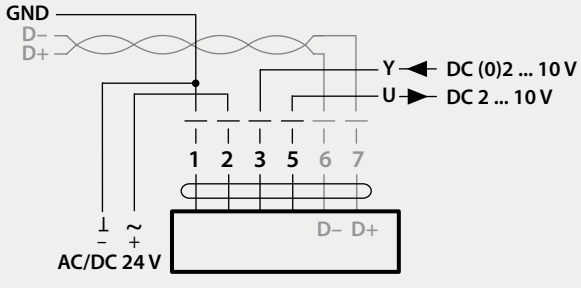
Switching contact requirements:
The switching contact must be able to switch a current of 16 mA at 24 V accurately

Connection with switching contact, e.g. Δp-monitor

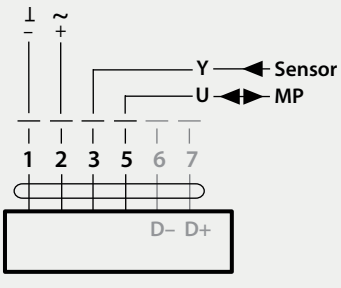


Possible voltage range:
0 ... 32 V (resolution 30 mV)

Connection of active sensors, e.g. 0...10 V @ 0...50 °C



BACnet MS/TP / Modbus RTU with analog setpoint (hybrid mode)



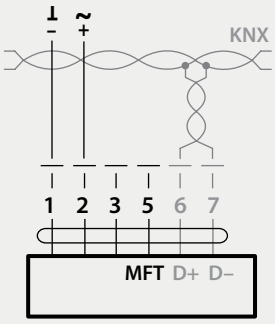
Operating on the MP-Bus

KNX connection

KNX devices are generally connected by a twisted pair bus and can be modified from a controller. Below is a connection scheme for KNX type actuators.

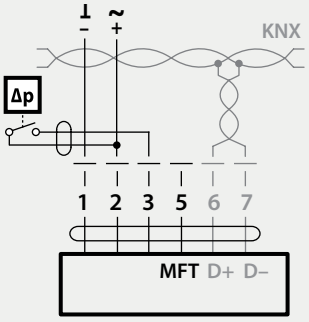
Type	Torque	Power consumption	Rating	Weight
LMV-D3-KNX	5 Nm	2 W	4 VA (max. 8 A @ 5 ms)	Approx. 500 g

Electrical installation



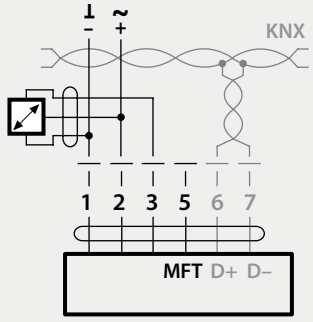
KNX signal assignment:
D+ = KNX+ (pink > red)
D – = KNX – (grey > black)
The connection to the KNX line should take place via WAGO connection terminals 222/221

Connection without sensor



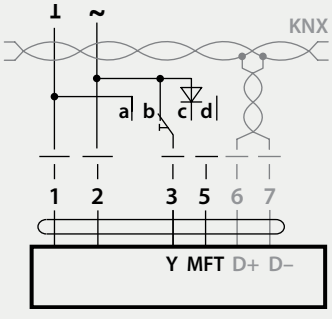
Switching contact requirements:
The switching contact must be able to switch a current of 16 mA at 24 V accurately

Connection with switching contact, e.g. Δp-monitor



Possible voltage range:
0 ... 32 V (resolution 30 mV)

Connection of active sensors, e.g. 0...10 V @ 0...50 °C



If no sensor is integrated, then connection 3 (Y) is available for the protective circuit of a local override control.
Options: CLOSED – V_{max} – OPEN
Note: Functions only with AC 24 V supply!

a Damper CLOSED
b V_{max}
c Damper OPEN
d Bus mode

Local override control

Pressure drop and sound power level

KOS-C PRESSURE DROP AND SOUND POWER LEVEL DIAGRAMS

The diagrams provide an A-weightened sound power levels that KOS-C damper emits in duct, L_{wa}. Correction factors K are provided to find emitted sound power level at the conformable frequency. Emitted sound L_W should be calculated as: $L_W = L_{wa} + K$.

Example: for KOS-C-125 damper with airflow Q = 90 m³/h and project pressure drop ΔP = 60 Pa, A-weightened sound power level is calculated as 42 dB(A).

To find emitted sound power level at 250 Hz, correction factor given in Table 1 should be used for Ø 125, so $L_W = 42 + 3 = 45$ dB(A).

Diagram 1: Ø 100 A – weightened sound power level L_{wa}, dB

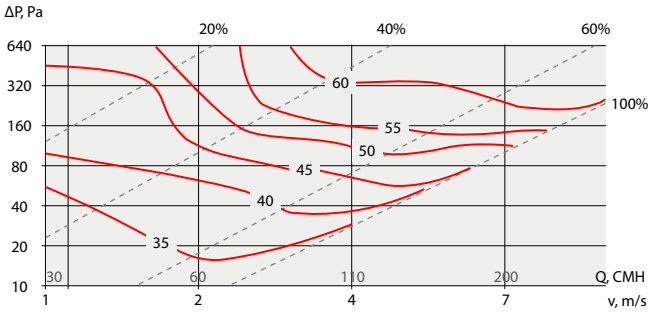


Diagram 2: Ø 125 A – weightened sound power level L_{wa}, dB

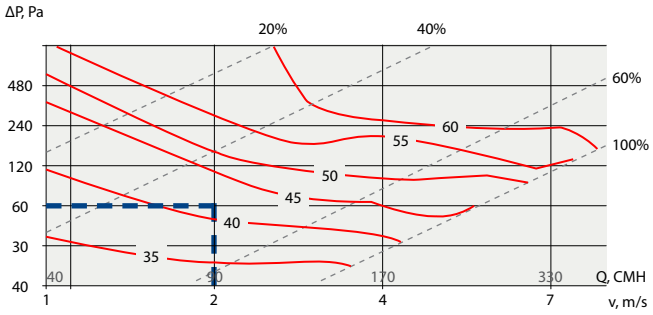


Diagram 3: Ø 160 A – weightened sound power level L_{wa}, dB

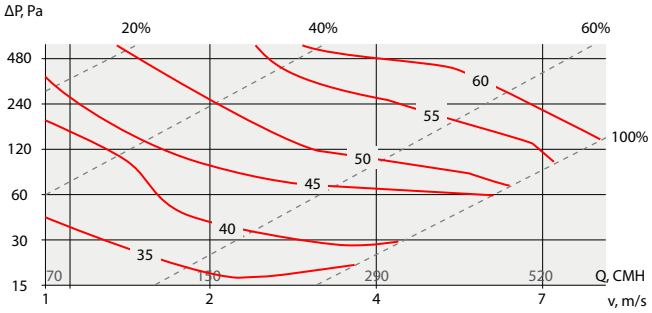


Diagram 4: Ø 200 A – weightened sound power level L_{wa}, dB

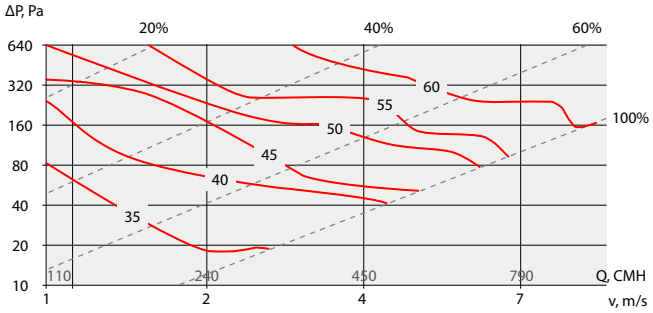


Diagram 5: Ø 250 A – weightened sound power level L_{wa}, dB

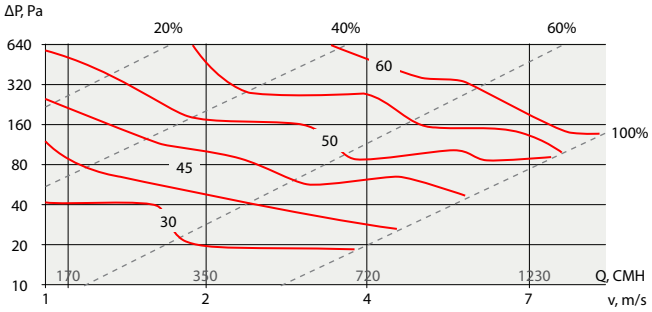


Diagram 6: Ø 315 A – weightened sound power level L_{wa}, dB

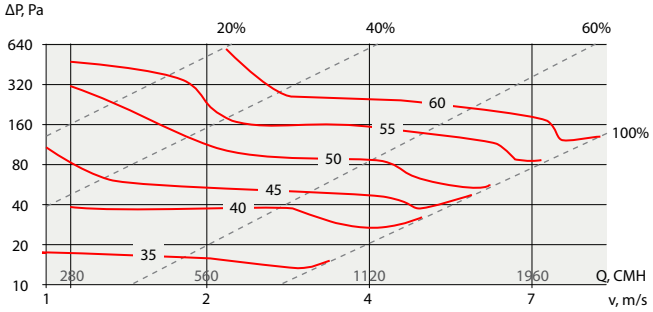


Diagram 7: Ø 355 A – weightened sound power level L_{wa}, dB

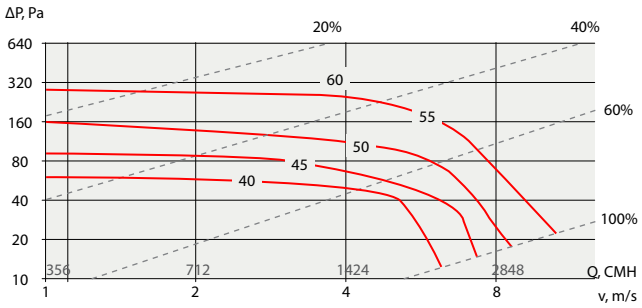


Diagram 8: Ø 400 A – weightened sound power level L_{wa}, dB

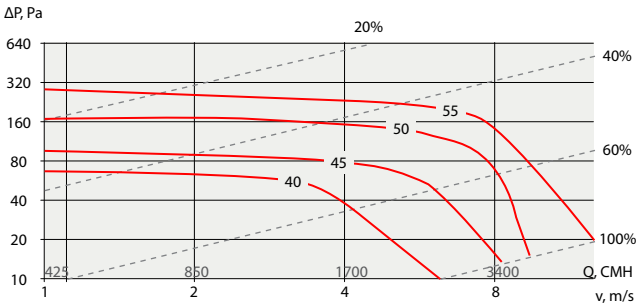


Diagram 9: Ø 500 A – weightened sound power level L_{wa}, dB

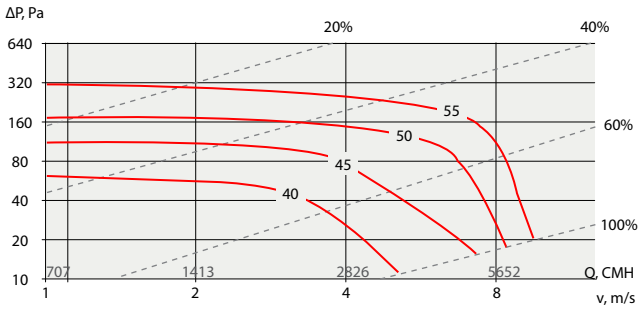
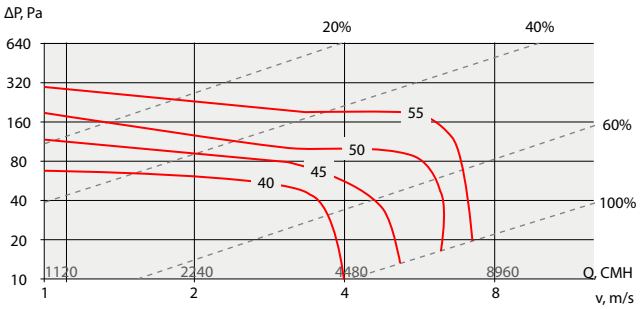


Diagram 10: Ø 560 A – weightened sound power level L_{wa}, dB



KOS-R-I has the following sound insulating capacity R, dBA for required frequency:

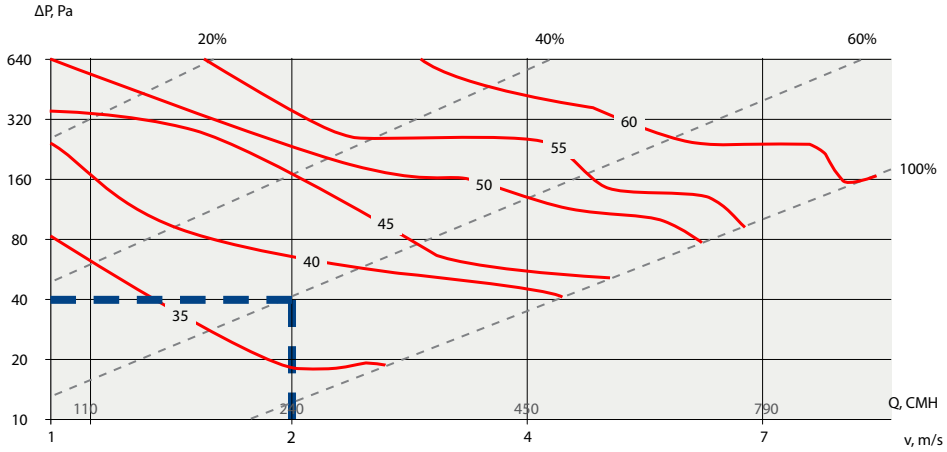
Ø	K, dB						
	63	**125**	**250**	**500**	**1000**	**4000**	**8000**
100	9	13	5	0	-3	-6	-7
125	13	5	3	-3	-7	-15	-20
160	10	6	0	-5	-9	-17	-22
200	9	5	-1	-6	-10	-19	-24
250	8	3	-3	-7	-10	-20	-26
315	6	1	-4	-8	-12	-22	-28
355	8	2	-2	-4	-9	-17	-18
400	11	6	1	-2	-7	-19	-20
500	10	5	-1	-2	-6	-18	-17
560	10	3	1	-3	-6	-13	-14

PRESSURE DROP DIAGRAM EXAMPLE

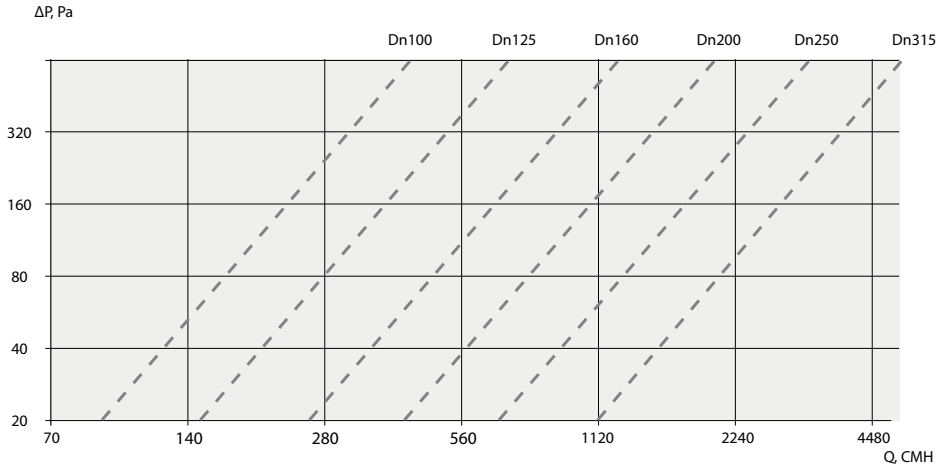
Pressure drop diagram indicates total pressure drop over the KOS-C damper as a function of air flow Q and the blade angle (100 % as totally open blade).

Example: for KOS-C 200 damper with airflow Q = 240 m³/h and blade position 60 %, total pressure drop ΔP = 40 Pa (see picture below).

Diagram 4: Ø 200 A – weightened sound power level L_{wa}, dB



Pressure drop on open VAV damper



KOS-R PRESSURE DROP AND SOUND POWER LEVEL

p_s [Pa]	f_{sr} [Hz]	Size B × H [mm]																			
		600																			
		100				200				300				400				500			
		v [m/s]																			
		3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12
		L_W [dB/Okt]																			
125	63	45	55	63	68	51	60	68	73	53	63	71	76	56	65	73	78	59	68	76	81
	125	46	56	63	68	49	58	66	71	51	60	68	73	52	61	69	74	53	63	71	75
	250	42	49	54	57	46	53	58	61	48	55	60	63	50	56	62	64	52	59	64	67
	500	44	47	50	52	45	48	51	53	45	49	51	53	46	49	52	53	46	50	52	54
	1000	46	49	51	53	48	50	53	54	48	51	53	55	49	52	54	55	50	52	55	56
	2000	46	49	51	53	49	52	54	56	51	54	56	58	52	55	57	59	54	57	59	60
	4000	39	43	47	49	41	46	50	52	43	47	51	53	44	49	52	55	45	50	54	56
	8000	32	37	41	43	36	41	45	47	38	43	47	50	40	45	49	51	42	47	51	54
250	63	52	61	68	72	56	64	71	75	58	66	73	77	59	68	75	79	61	70	77	81
	125	49	58	65	70	53	61	69	73	55	64	71	75	56	65	72	77	58	67	74	79
	250	46	53	58	62	49	56	62	66	51	58	64	68	53	60	66	69	55	62	68	72
	500	48	52	56	58	50	54	58	60	51	55	59	61	51	56	59	62	52	57	61	63
	1000	51	54	57	59	52	56	59	61	53	57	60	61	54	57	60	62	55	58	61	63
	2000	53	56	58	59	56	58	61	62	57	60	62	64	58	61	63	65	60	63	65	66
	4000	49	52	55	57	51	54	57	59	52	56	59	60	53	56	59	61	54	58	61	63
	8000	45	49	52	54	47	51	54	56	49	53	56	58	50	64	57	59	51	55	58	60
500	63	57	65	72	76	60	69	76	80	63	71	78	82	64	73	80	84	67	75	82	86
	125	53	63	71	77	56	66	74	80	58	68	76	81	59	69	77	83	61	71	79	84
	250	49	58	66	70	55	64	72	76	59	68	75	80	61	70	78	82	54	74	81	86
	500	53	59	63	66	56	62	66	69	58	63	68	71	59	65	69	72	61	66	71	73
	1000	59	62	64	66	61	64	66	67	62	64	67	68	62	65	68	69	63	66	69	70
	2000	64	65	66	66	66	67	68	69	68	69	70	70	69	70	71	71	70	71	72	73
	4000	63	64	65	66	65	66	67	68	66	67	68	69	67	68	69	69	68	69	70	70
	8000	59	61	63	64	61	63	65	66	62	65	66	68	63	65	67	69	64	67	69	70

p_s [Pa]	f_{sr} [Hz]	Size B × H [mm]																			
		600				1000															
		600				700				800				900				1000			
		v [m/s]																			
		3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12	3	6	9	12
		L_W [dB/Okt]																			
125	63	59	68	76	81	62	71	79	84	64	74	82	87	65	75	83	88	66	76	83	88
	125	53	63	71	75	55	65	73	77	57	66	74	79	57	67	75	80	57	67	75	80
	250	52	59	64	67	54	61	66	69	56	63	68	71	57	64	69	72	58	64	69	73
	500	46	50	52	54	47	51	53	55	47	51	53	55	48	51	54	55	48	51	54	55
	1000	50	52	55	56	51	53	56	57	51	54	56	57	51	54	56	58	51	54	56	58
	2000	54	57	59	60	56	59	61	62	57	60	62	64	58	61	63	65	58	61	63	65
	4000	45	50	54	56	47	52	56	58	49	53	57	59	49	54	58	60	49	54	58	60
	8000	42	47	51	54	45	50	54	56	47	52	56	58	48	53	57	59	48	53	57	59
250	63	61	70	77	81	63	72	79	83	65	74	80	85	66	75	81	86	66	75	82	86
	125	58	67	74	79	60	69	77	81	62	71	79	83	63	72	80	84	64	72	80	84
	250	55	62	68	72	57	65	70	74	59	67	72	76	60	68	73	77	61	68	73	77
	500	52	57	61	63	54	58	62	64	55	59	63	65	55	60	63	66	55	60	63	66
	1000	55	58	61	63	56	59	62	64	57	60	63	65	57	61	64	65	57	61	64	65
	2000	60	63	65	66	62	65	67	68	63	66	68	69	64	67	69	70	64	67	69	70
	4000	54	58	61	63	56	59	62	64	57	60	63	65	57	61	64	66	57	61	64	66
	8000	51	55	58	60	53	57	60	62	54	58	61	63	55	59	62	64	55	59	62	64
500	63	67	75	82	86	69	78	85	89	71	80	87	91	72	81	88	92	72	81	88	92
	125	61	71	79	84	63	73	81	86	64	74	83	88	65	75	84	89	65	75	84	89
	250	65	74	81	86	69	78	85	90	72	81	88	93	73	82	89	94	74	83	90	95
	500	61	66	71	73	63	68	73	75	64	70	74	77	65	71	75	78	65	71	75	78
	1000	63	66	69	70	64	67	70	71	65	68	70	72	66	69	71	72	66	69	71	72
	2000	70	71	72	73	72	73	74	75	73	75	75	76	74	75	76	77	74	75	76	77
	4000	68	69	70	70	69	70	71	72	70	71	72	73	70	72	73	73	70	72	73	73
	8000	64	67	69	70	66	68	70	71	67	69	71	72	68	70	72	73	68	70	72	73

Correction values

CORRECTION VALUES FOR OTHER CASE WIDTHS

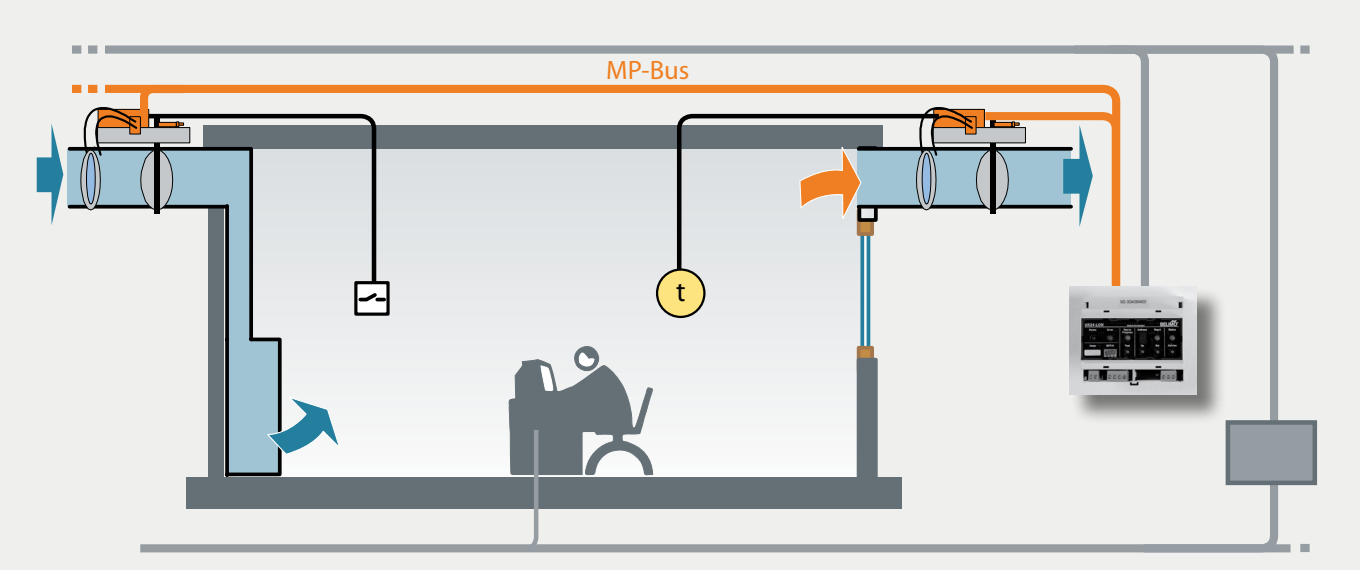
Δp_s [Pa]	f_{gr} [Hz]	In relation to B [mm]											
		600									1000		
		200	300	400	500	600	700	800	900	1000	800	900	1000
125	63	-8	-5	-3	-1	0	1	2	3	4	-2	-1	0
	125	-4	-3	-2	-1	0	1	1	2	2	-1	-1	0
	250	-6	-4	-2	-1	0	1	2	2	3	0	0	0
	500	-2	-1	-1	0	0	0	0	1	1	-1	-1	0
	1000	-2	-1	-1	0	0	0	1	1	1	-1	0	0
	2000	-5	-3	-2	-1	0	1	1	2	2	-1	0	0
	4000	-4	-3	-2	-1	0	1	1	2	2	-1	-1	0
	8000	-6	-4	-2	-1	0	1	2	2	3	0	-1	0
250	63	-5	-3	-2	-1	0	1	1	2	3	-1	-1	0
	125	-6	-4	-2	-1	0	1	1	2	3	-1	-1	0
	250	-6	-4	-2	-1	0	1	2	2	1	-1	-1	0
	500	-3	-2	-1	0	0	0	1	1	1	-1	0	0
	1000	-3	-2	-1	0	0	0	1	1	2	-1	0	0
	2000	-4	-3	-2	-1	0	1	1	2	2	-1	0	0
	4000	-3	-2	-1	-1	0	0	1	1	2	-1	0	0
	8000	-4	-3	-1	-1	0	1	1	1	3	-1	0	0
500	63	-6	-4	-2	-1	0	1	2	2	2	-1	-1	0
	125	-5	-3	-2	-1	0	1	1	2	4	-1	-1	0
	250	-10	-6	-4	-2	0	1	3	4	2	-1	0	0
	500	-5	-3	-2	-1	0	1	1	2	1	-2	-1	0
	1000	-3	-2	-1	0	0	1	1	1	2	-1	0	0
	2000	-4	-3	-2	-1	0	1	1	2	1	-1	0	0
	4000	-3	-2	-1	0	0	0	1	1	2	-1	0	0
	8000	-3	-2	-1	-1	0	0	1	1	2	-1	0	0

Control systems

VAV DAMPERS WITH BUS CONNECTION

INTELLIGENT SIMPLICITY

- System connection to DDC controller with MP interface via MP-Bus®
- Integration in higher-level systems such as LONWORKS®, Konnex, Ethernet TCP/IP, Profibus DP, Modbus RTU etc. via MP gateway
- Convenient, cost-efficient wiring
- Maximum flexibility in new, retrofitted, converted or renovated buildings



MP-BUS® LONMARK® KNX® PROFIBUS® Modbus-RTU ASHRAE BACnet®

ACTUATOR ADJUSTMENT TOOLS

ZTH SERVICE TOOL

The ZTH directly connects to the Belimo Multi-Function Technology (MFT) series actuator offering the ability to quickly change the parameters of the actuator, such as control input, control feedback, runtime, and minimum and maximum values.

BELIMO ASSISTANT APP

Belimo Assistant app allows you to check and control your actuator using your smartphone. No ZTH tool needed! Simple, wireless connection via integrated NFC interface. App displays device-specific identification data: device type, position, designation, serial number, MP address. Even when actuator is deenergized data can be read and written.

It is also possible to store operating/setting data on the smartphone or send data directly from system via e-mail, WhatsApp or SMS.

For using hold smartphone close to Belimo actuator. The NFC- antenna of the phone, respectively the converter's eye must be placed right over the actuator's NFC-logo. After connection is succeed application will display settings automatically.

Additional information can be obtained from www.belimo.com.

Order information

CIRCULAR VAV AIR DAMPER ORDER SAMPLE

KOS - C - I - N - 160 - BMF - 0 - 100-300

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ **Damper type:** KOS

❷ **C** – circular
R – rectangular

❸ **I** – with insulation 50 mm
No entry – without insulation

❹ **N** – stainless steel casing
No entry – zinc coated casing

❺ **Diameter**: 100/125/160/200/250/315/355/400/450/500/560

❻ **Acturator type**: **BMF** – analogue connection
BMP – MP-bus connection
BMD – Modbus communication
BMDbn – BACnet communication
BKX – KNX communication

❼ **Control signal**: **0** – 0..10 V
2 – 2..10 V

❽ V_{min}-V_{max} – defined air flow, m^3/h

RECTANGULAR VAV AIR DAMPER ORDER SAMPLE

KOS - R - I - N - 400x300 - BMF - 0 - 755-2592

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ **Damper type:** KOS

❷ **C** – circular
R – rectangular

❸ **I** – with insulation 50 mm
No entry – without insulation

❹ **N** – stainless steel casing
No entry – zinc coated casing

❺ **Size**: 200x100 ... 1000x1000 mm

❻ **Acturator type**: **BMF** – analogue connection
BMP – MP-bus connection
BMD – Modbus communication
BMDbn – BACnet communication
BKX – KNX communication

❼ **Control signal**: **0** – 0..10 V
2 – 2..10 V

❽ V_{min}-V_{max} – defined air flow, m^3/h

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