Membrane Air-Spring Insulator BiAir®

with deep natural frequency and adjustable dampening (pat.) for vibration insulation of measuring and testing machines, optical and electronic equipment, laser machines, fine machining plant, vehicle and motor performance testers etc.

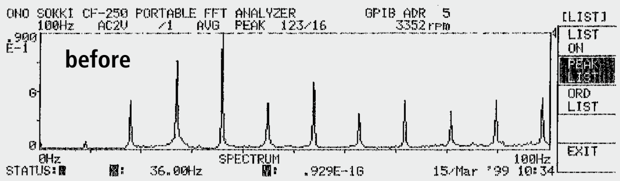
BiAir®

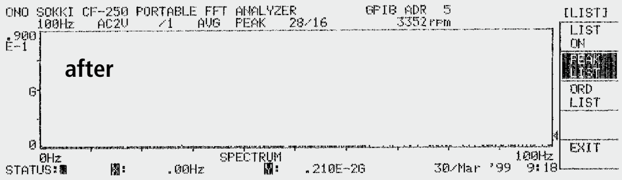
Product Description

The Air-Spring Insulator **BiAir®** consists of a cast aluminum body whose air volume is enclosed by a thin-walled, flexible and pressure-resistant rolling diaphragm. The piston is seated on this diaphragm and is pushed into the air volume. This design causes highly effective vibration insulation.
In order to obtain as high a dampening effect as possible, the air space is split into two chambers (load/dampening volume) linked by air pipe. By the adjustable valve the dampening can be easily changed from outside. Due to the friction caused by the air-stream passing through the bypass valve, up to 20% dampening can be effected.
Additional safety valves will protect the roller diaphragm from getting damaged by over-inflation.

Range of Application

Highly effective vibration insulation of sensitive measuring and testing machines, fine-machining plant, as well as optical and electronic equipment. Another important range of application is the vibration-insulated foundation of vehicle, motor and other performance testers. **BiAir®** Air-Spring insulators are extremely well suited for the insulation of foundations e.g. equivalent machine loads.





Advantages compared with conventional steel springs

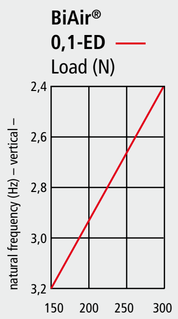
BiAir® Air-Spring insulators with level control are an active system. The machine/foundation level consistancy will always be preserved! Automatic leveling/adjustment!

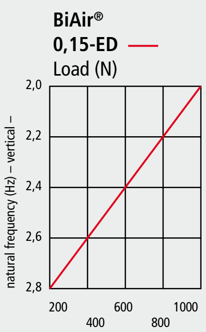
BILZ level controller systems

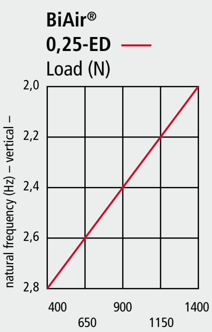
Level control is an important part of an optimally functioning air spring system. The automatic level controller can be utilized to overcome the problem associated with load changes in air-spring insulated machines, which can result in tilting of the machine.
The height of the specific elements **BiAir®** or **FAEBI®** can be controlled by changing the air pressure in the air-spring insulators. Quick inflation or deflation will hold the machines level even if their center of gravity keeps changing.

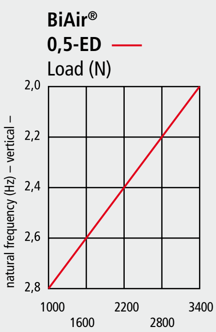
Control circuit

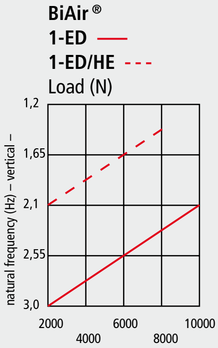
The circuit consists of at least three air springs. If more air springs are needed for structural or loading reasons, the system must always include 3 position pickups, e.g. three controlled components in order to avoid statical overdefinition. This is achieved by connecting sets of air springs in parallel.

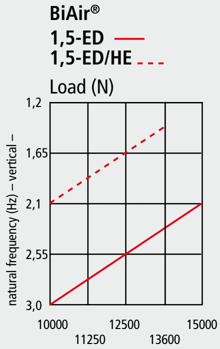


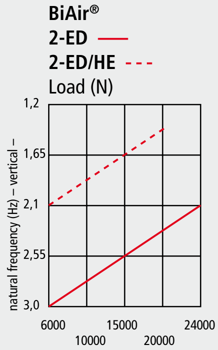


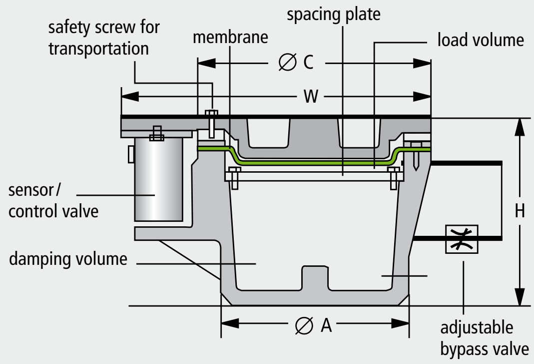




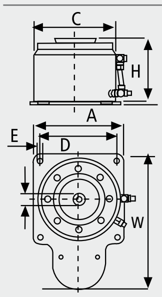
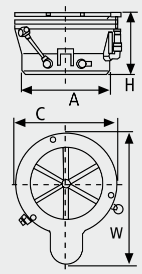
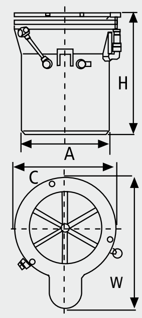






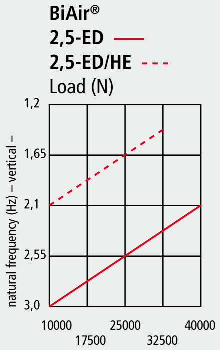


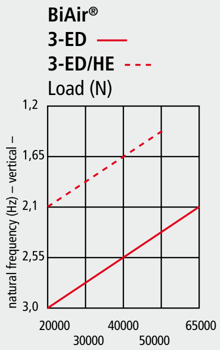
Zeiss measuring center mounted on BiAir®

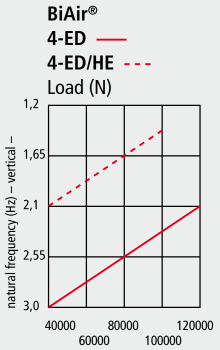
	type	Ø A mm	W mm	Ø C mm	workheight H mm	max. load N at max. 4 bar	max. load N at max. 6 bar	natural frequency Hz (vertical) approx.	natural frequency Hz (horizontale) approx.
	BiAir® 0,1 -ED-ST	76	72	72	77	180	270	3	3
	BiAir® 0,15-ED-ST	76	72	72	77	670	1000	2,5	2,5
	BiAir® 0,25-ED-ST	110	182	110	87	1130	1700	2,5	2,5
	BiAir® 0,5 -ED-ST	130	190	129	100	2670	4000	2,5	2,5
	BiAir® 1 -ED-ST	200	275	200	100	6330	9500	2,5	2,5
	BiAir® 2 -ED-ST	260	350	260	100	14200	21300	2,5	2,5
	BiAir® 2,5 -ED-ST	300	390	300	100	19670	29500	2,5	2,5
	BiAir® 0,5-ED	120	216	129	157	2670	4000	2,5	2,5
	BiAir® 1 -ED	172	288	200	157	6330	9500	2,5	2,5
	BiAir® 1,5-ED	212	305	230	157	10170	15260	2,5	2,5
	BiAir® 2 -ED	226	335	260	157	14200	21300	2,5	2,5
	BiAir® 2,5-ED	271	378	300	157	19670	29500	2,5	2,5
	BiAir® 3 -ED	348	467	382	157	34130	51200	2,5	2,5
	BiAir® 4 -ED	490	605	530	157	65730	98600	2,5	2,5
	BiAir® 5 -ED	747	855	798	157	155730	233600	2,5	2,5
	BiAir® 1 -ED/HE	172	288	200	307	6330	9500	1,7	2,5
	BiAir® 1,5-ED/HE	215	305	230	307	10170	15260	1,7	2,5
	BiAir® 2 -ED/HE	226	335	260	307	14200	21300	1,7	2,5
	BiAir® 2,5-ED/HE	271	378	300	307	19670	29500	1,7	2,5
	BiAir® 3 -ED/HE	348	467	382	307	34130	51200	1,7	2,5
	BiAir® 4 -ED/HE	490	605	530	307	65730	98600	1,7	2,5
	BiAir® 4 -ED/HE-Max	490	605	530	509	65730	98600	1,1	2,5
	BiAir® 5 -ED/HE-Max	718	960	880	509	155730	233600	1,1	2,0
						When choosing the size of the air-spring consider loading at 4 bar only.			

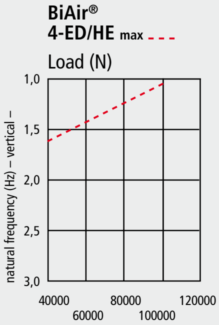
ST = Steel

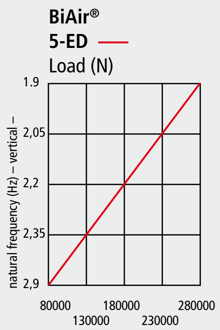
Air springs with higher max. loads as well as air springs with lower natural frequencies can be supplied upon request!

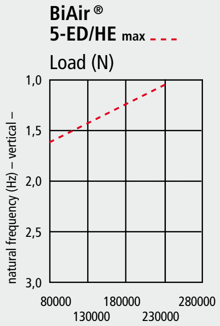












Membrane Air-Spring Insulator BiAir®

with level controller system

BiAir® mechanical-pneumatic positioner / controller (MPN-PVM)

The mechanical-pneumatic relief valves are a simple yet effective solution. The level is constantly scanned by a plunger. The plunger position is transmitted to a spool valve. Depending on the spool valve position, pressure is either applied to the air spring or vented from the inside of the air spring. The machine level can be maintained at an accur-acy ± 1/100 mm.

Principally three control valves are used. The incoming air supply is conditioned with a pressure regulator to limit system pressure to a maximum of 6 bar and with a water trap to remove vapor and an air filter to remove dust and any foreign bodies from the air supply.

BiAir® electro-pneumatic positioner/controller (EPN)

Advantages

Important advantages of the BILZ level control are:

- a high reset accuracy e.g. level accuracy of ± 1/100 mm
- extremely short reaction time (within the milli-second range)
- the general possibility of being able to optimally adapt (increase and reset) the speed of the system to the specific conditions (control curcuit)
- wear-resistant and sturdy relief valves
- simple and effective set-up operation
- For highly-dynamic machines with high precision requirements, we recommended the new **EPN – FAST**, which can handle very high volume flows and is fitted with frictionless embedded valves.

System components

Each system consists of 3 position sensors, 3 electro-pneumatical relief valves, one control unit (digital computer logic), the air-supply regulator and filter units.

Even the most severe conditions are mastered by the electro-pneumatical positioner. It is used mainly where high reset precision and extremely short reaction times are required.
Any deviation (difference between desired value and actual value) from the desired height (desired value) of the air spring insulators is measured at a precision of up to 1/100 mm accuracy by means of position sensors.
In the control unit, these electronic signals will then be processed and the air spring elements will be inflated or deflated accordingly for level equalisation via the pneumatic relief valves.

Control unit

The control unit consists of a printed circuit board, containing the entire logic of the 3 control circuits, 3 air pressure displays for the air springs, adjusting screws for the adjustment of the machine, selection of the controller speed, and a switch to enable complete deflation of the air springs. The control unit can be supplied either as a 19 inch rack mount unit or completely enclosed within a cabinet.

Software

As an optional feature, a special software package is available. By means of this software, the adjustment and optimization of cont-rolled conditions, the registration of adjustment parameters as well as error determination can be carried out via the serial interface (se-rial interface provided on the control unit).
Furthermore, the integrated serial interface enables link-ups with available machine computers or systems to be insulated. A number of more complex system modes can be realized this way.