MEFA Spring hanger

MEFA Spring hanger are suited to be also used as flexible pipe bearing or for the elastic storage of assemblies.

Applications:

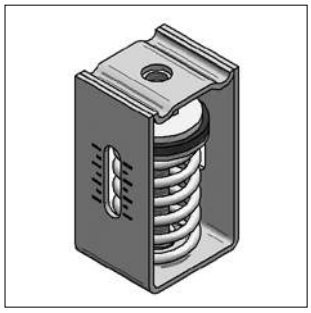
a) Applicable as a compensating element for thermal pipeline expansions
b) Suitable for sound- and vibrance insulation
c) Applicable as shock-absorbing element

Spring bearings or -insulator can be used for installations where no rigid storage of plant systems (e.g. pipelines, assemblies) are allowed. For example a pipeline exposed to a certain temperature which requires due to its temperature bending an elastic storage.

An important advantage of the MEFA spring hanger and bearings is, that there is no metallic contact between the construction and the pipeline. In combination with a sound absorbing decoupling element, the transfer of the structure-born-sound via the steel spring can be avoided.

MEFA spring hanger meet the requirements of vibration insulation and disconnection of structure-borne-sound.

For an optimum dimensioning of the spring bearings/ -hanger please contact our technical department.



Spring insulator FH1
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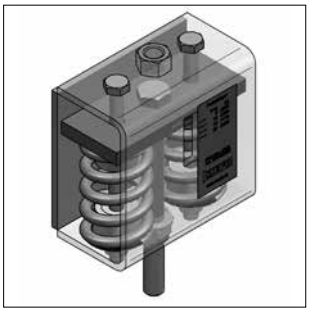
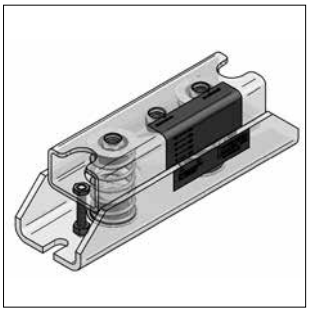


Spring insulator FH2
Page 3c/2



Spring bearing FL
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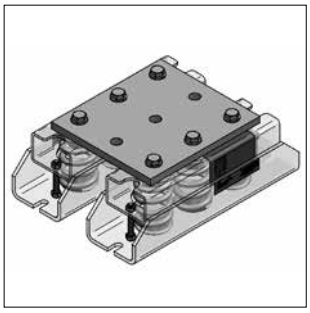

Spring bearing FLD
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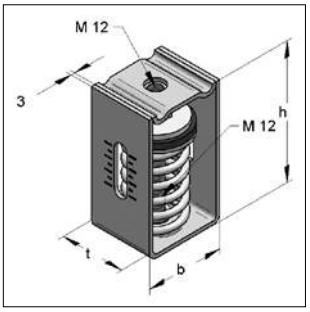
Spring insulator FH 1 with one spring



Spring insulator FH1
Load range: up to 3000 N

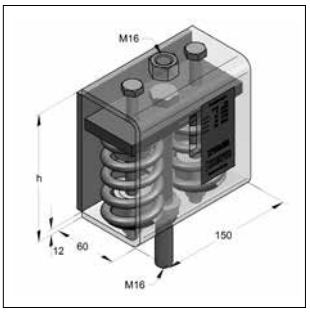
3c

Specification:
Number of springs: 1 piece
Load range: up to 3000 N
Spring deflection: up to 32 mm

Technical data:
Material: steel
Material type: S235JR
Surface: galvanized

Identification	Load range [N]	Spring deflection [mm]	connection thread	Dimension h [mm]	b [mm]	t [mm]	Weight [kg/pc.]	Packing [pc.]	Part-No.
FH 1 - 400	0 - 386	0 - 30,0	M12	105	60	50	0,620	1	0794040
FH 1 - 600	0 - 619	0 - 30,0	M12	105	60	50	0,657	1	0794060
FH 1 - 1000	0 - 1006	0 - 32,0	M12	105	60	50	0,659	1	0794100
FH 1 - 1300	0 - 1289	0 - 31,0	M12	130	80	60	1,040	1	0794130
FH 1 - 2100	0 - 2113	0 - 28,0	M12	130	80	60	1,228	1	0794210
FH 1 - 3000	0 - 3084	0 - 23,0	M12	130	80	60	1,266	1	0794300

Spring insulator FH 2 with two springs



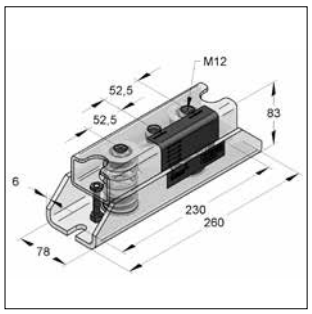
Spring insulator FH2
Load range: up to 9300 N

Specification:
Number of springs: 2 pieces
Load range: up to 9068 N
Spring deflection: up to 28,5 mm

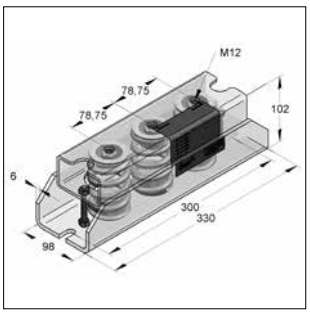
Technical data:
Material: steel
Material type: S235JR
Surface: galvanized

Identification	Load range [N]	Spring deflection [mm]	connection thread	Dimension h [mm]	width [mm]	Length [mm]	Weight [kg/pc.]	Packing [pc.]	Part-No.
FH 2 - 4300 plus	0 - 4301	0 - 28,5	M16	140	80	140	4,99	1	079170430
FH 2 - 6000 plus	0 - 6044	0 - 22,5	M16	140	80	140	5,01	1	079170600
FH 2 - 9300 plus	955 - 9068	0 - 19,0	M16	140	80	140	5,03	1	079180930

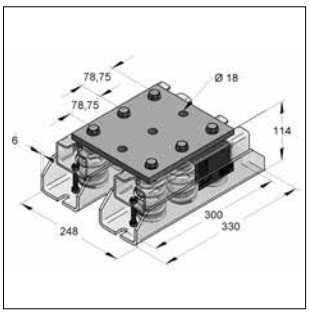
Spring bearing FL



Spring bearing FL
2 springs



Spring bearing FL
3 springs



Spring bearing FLD
two spring bearings connected
with interface

Specification:

Number of springs:	2 pieces / 3 pieces
Casing:	type 1 / type 2
Load range:	up to 21354 N
Spring deflection:	up to 26,5 mm
Recommended anchor:	Bolt anchor BZ plus M12

Technical data:

Material:	steel
Material type:	S235JR
Surface:	galvanized

3c

Identification	Casing	Load range [N]	Number of springs	Spring Deflection [mm]	Weight [kg/pc.]	VPE [pc.]	Part-No.
Spring bearing FL							
FL-700	**Type 1**	0 - 682	2	0 - 26,5	3,00	1	07919007
FL-1000	**Type 1**	0 - 1023	3	0 - 26,5	3,10	1	07919010
FL-2300	**Type 2**	0 - 2204	2	0 - 26,5	5,70	1	07919023
FL-3800	**Type 2**	0 - 3999	2	0 - 26,5	5,70	1	07919038
FL-5700	**Type 2**	0 - 5999	3	0 - 26,5	6,00	1	07919057
FL-7200	**Type 2**	0 - 7118	2	0 - 26,5	5,70	1	07919072
FL-10500	**Type 2**	0 - 10677	3	0 - 26,5	6,00	1	07919105
Spring bearing FLD							
FLD-21000		0 - 21354	2 x 3	0 - 26,5	16,23	1	07929210

Design of the spring bearings

In this short documentation the procedure for the correct construction of the spring hanger with critical bending will be explained. The base should be in any case a calculation of the pipeline for the mentioned sector:

Please notice the following production steps:

1. The „free“ forming of the tested pipeline should be detected
2. In case of vertical forming Δs **(Δs ≥ 10mm)** mounting the spring hanger is necessary
3. The static load should be detected on the point of support **(→operation load $F_{V, operation}$)**
4. Spring hanger should be choosed with help of the detected point of support and the suited selection chart (page 3cl5). Please notice that the point of support is situated in the middle of the grid of the selected insulator. The choice of the rigidity is very important as due to the forming the **operation load $\Delta F_V = R \times \Delta s$** cannot cause any **incorrect additional load to the mounted pipeline**
5. Spring hanger **carry the load basically via pressure.** A vertical mounted spring insulator with a negative forming increases the **point of support ΔF**

The effective bearing strength is

$$F_{V,compl.} = F_{V,operation} + (R \times (\pm \Delta s))$$

(in case of positive, on top formings the bearing strength will be reduced → spring insulator will be unload.)

Example: Expansion compensation

Expansion movement of a heating installation pipe of a defined fixpoint line

Known data:	- detected expansion movement	Δs = 16 mm
	- load on the mounting bracket	F_V = 1.300 N
Solution method (see shedule):		
	ⓐ Outlet spring deflection	Δs = 16 mm
	ⓑ Load allocation	F_V = 1.300 N
Result:	ⓒ Choice spring hanger	FH 1 - 2100

Combination of spring bearings:

Series connection

e.g. for the enlargement of spring deflections

F_V = vertical operation load
Δs = spring deflection / vertical forming
R = spring rate

Series connection with 2 equal spring hanger:

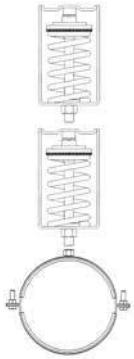
$$R_{compl} = (R_1 + R_2)/2$$

$$\Delta S_{compl} = \Delta s_1 + \Delta s_2$$

Series connection with 2 different spring hanger:

$$R_{compl} = (R_1 \times R_2)/(R_1 + R_2)$$

$$\Delta S_{compl} = \Delta s_1 + \Delta s_2$$



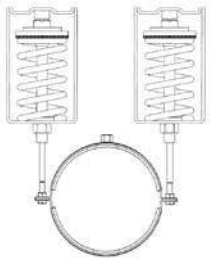
Parallel connection

e.g for the increasing of bearing pressure

F_V = vertical operation load
Δs = spring deflection / vertical forming
R = spring rate

$$R_{compl} = R_1 + R_2$$

$$\Delta S_{compl} = \Delta s/2$$

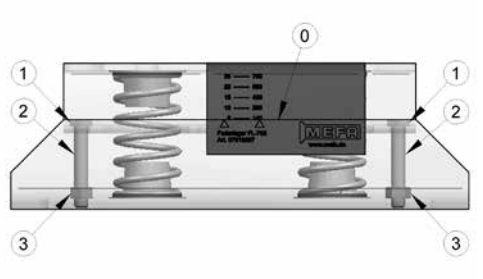


Spring insulator selection table

Spring-insulator	Spring rate	Max. working load	Distance at max. working load	Load dependent on spring deflection s								
					suitable section							
				5 [mm]	10 [mm]	15 [mm]	17,5 [mm]	20 [mm]	22,5 [mm]	25 [mm]	26,5 [mm]	30 [mm]
[Type]	[N/mm]	[N]	[mm]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
FH1-400	12,87	386	30,0	64	129	193 (a)	225	257	290	322	341	386
FH1-600	20,62	619	30,0	103	206	309	361	412	464	516	546	619
FH1-1000	31,43	1.006	32,0	157	314	471	550	629	707	786	833	943
FH1-1300	41,58	1.289	31,0	208	416	624	728	832	936	1.040	1.102	1.247
FH1-2100	75,46	2.113	28,0	377	755	1.132 (b)	1.321	1.509	1.698	1.887	2.000	-
(c)												
FH1-3000	134,1	3.084	23,0	671	1.341	2.012	2.347	2.682	3.017	-	-	-
FH2-4300 p	150,92	4.301	28,5	755	1.509	2.264	2.641	3.018	3.396	3.773	3.999	-
FH2-6000 p	268,60	6.044	22,5	1.343	2.686	4.029	4.701	5.372	6.044	-	-	-
FH2-9300 p	477,28	9.068	19,0	2.386	4.773	7.159	8.352	-	-	-	-	-
FL-700	25,74	682	26,5	129	257	386	450	515	579	644	682	-
FL-1000	38,61	1.023	26,5	193	386	579	676	772	869	965	1.023	-
FL-2300	83,16	2.204	26,5	416	832	1.247	1.455	1.663	1.871	2.079	2.204	-
FL-3800	150,92	3.999	26,5	755	1.509	2.264	2.641	3.018	3.396	3.773	3.999	-
FL-5700	226,38	5.999	26,5	1.132	2.264	3.396	3.962	4.528	5.094	5.660	5.999	-
FL-7200	268,60	7.118	26,5	1.343	2.686	4.029	4.701	5.372	6.044	6.715	7.118	-
FL-10500	402,90	10.677	26,5	2.015	4.029	6.044	7.051	8.058	9.065	10.073	10.677	-
FL-21000	805,80	21.354	26,5	4.029	8.058	12.087	14.102	16.116	18.131	20.145	21.354	-

Tolerance range of the spring rate -5 / +10 %

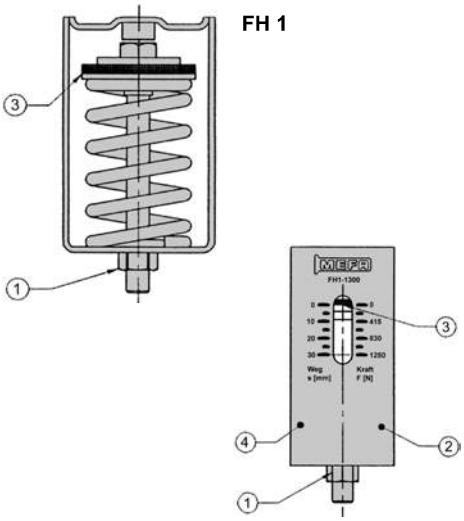
Assembly instruction for Spring bearing FL



Target: Vibration isolation

1. The spring bearing can be clamped via 2 hex. screws with suitable load for stationary handling with help of prestressed hex. screws M8 (SW13 mm) [1]. (values for direct reading, significant value for direct reading on upper edge of casing base part [0])
2. Spring bearing should be mounted on substructure
3. Spring bearing can be mounted with pipeline or a compressor via:
   3.1 pipe clamp and suitable threaded rod or
   3.2 supporting elements or compressor
4. After achieving operation load at stationary handling the prestressed nut M8 has to be screwed out (SW 13 mm) [1]. Equalisation of springload, bearing sets automatically
5. After balancing spring pot, threaded pins [2] can be removed. Remove counter nuts [3] and screw out threaded pins [2]

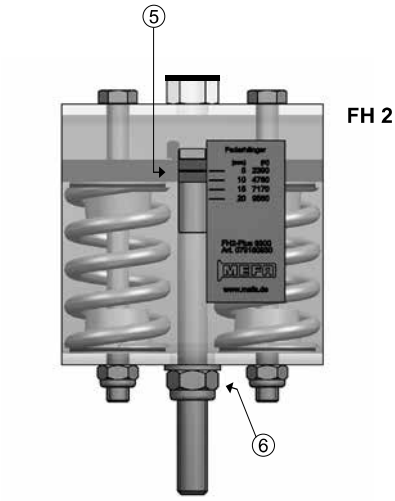
Assembly instruction for spring insulator FH 1 and FH 2



Target: Vibration isolation

1. The spring insulator is prestressed to absorb the load, for stationary handling, via the suitable hex. nut M12 (SW 19 mm) [1] / M16 (SW 24 mm) [6] (for direct reading FH 1: scale on the outside [2] or notch [5] on label, FH 2: bottom edge red washer [3])
2. The spring insulator has to be mounted on the structure
3. Spring insulator with the pipe clamp can be mounted via pipe clamp, compressor or a traverse, with the help of the suitable connecting elements (threaded rod, treaded coupling and counter nut)

   After achieving the operation load at the stationary handling, the hexagon screw [1/6] of the spring insulator should be mounted on the towards-mounted element (e.g. threaded coupling) and used as a counter nut
5. The equalisation of load of the spring pot sets automatically



Target: Compensation of expansion movement

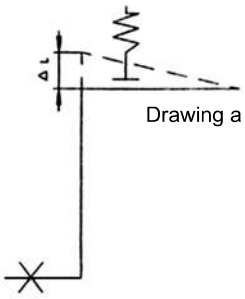
1. In a defined, vertical fixpoint pipeline (see drawing a and b) the spring pot can be...

   - pestressed according to **drawing a**, via the hex. screw M12 (SW 19 mm) [1] or M16 (SW 24 mm) [6] (for direct reading FH1: scale on the outside [4] or notch [5] on label, FH 2: bottom edge red washer [3])

     During mounting the pipeline is prestressed !

   - according to **drawing b**, not prestressed

   The pipeline load of this bracket has to be noticed when choosing the spring bearing. The load and the spring deflection have to be regarded. The load of the pipeline increases, in the stationary section, about the amount of the equivalent spring rate to the spring deflection
2. The spring insulator has to be mounted on the structure
3. Spring insulator with the pipe clamp can be mounted via pipe clamp, compressor or a traverse, with the help of the suitable connecting elements (threaded rod, treaded coupling and counter nut or adapted traverse mountings)



4. Releasing the springs:

   4.1 After successful mounting of the pipeline according to the **drawing a**, should the hex. screw M12 (SW 19 mm) [1] / M16 (SW 24 mm) [6] be mounted on the towards-mounted element (e.g. threaded coupling) and used as a counter nut, before using the pipeline

   4.2 After succesful mounting of the pipeline according to the **drawing b**, should the hex. screw M12 (SW 19 mm) [1] / M16 (SW 24 mm) [6] be mounted on the towards-mounted element (e.g. threaded coupling) and used as a counter nut, before using the pipeline
5. The equalisation of load of the spring pot sets automatically