AVC

Wire rope vibration damper
Stainless steel

CABLE, BARS AND SCREWS
AISI 316 stainless steel.

STANDARD EXECUTIONS
Threaded pass-through holes.
- **AVC-4**: the cable extends for four loops.
- **AVC-6**: the cable extends for six loops.
- **AVC-8**: the cable extends for eight loops.

FEATURES AND APPLICATIONS
AVC wire rope vibration dampers are composed of two pairs of bars, joined together by a connecting cable with a helical winding (loop). They are generally used for isolating vibrations and shock absorption, where resistance to tension, compression and shear force is required. Vibrations can cause:
- malfunctioning and reduction of the machine lifespan and/or of the adjacent ones;
- damage to health;
- noise.

They are particularly suitable for use with HVAC, pumps, purification and desalination plants, instrumentation panels, rail, naval and military industry. Some examples of application are shown in Fig.1. See High performance vibration dampers - Characteristics and selection criteria (on page -).

SPECIAL EXECUTIONS ON REQUEST
- Wire rope vibration dampers with AISI 304 stainless steel bars.
- Wire rope vibration dampers with aluminium bars with chromic passivation.

Fig.1
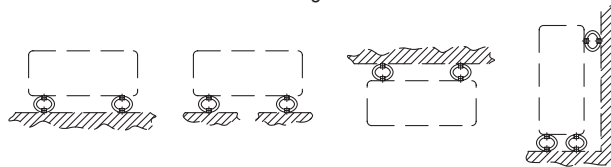
Description	Compression resistance				Axial holding force				Shear resistance			
	Min load [N]	Max load [N]	Min deflection [mm]	Max deflection [mm]	Min load [N]	Max load [N]	Min deflection [mm]	Max. deflection [mm]	Min load [N]	Max load [N]	Min deflection [mm]	Max. deflection [mm]
AVC-4-4-53	50	110	2	5	50	110	1	3	20	40	5	10
AVC-4-6-61	200	300	2	4	200	300	2	3	70	150	3	7
AVC-4-6-93	70	140	2	7	70	140	3	6	30	70	5	13
AVC-4-7-110	80	180	2	9	80	180	2	8	30	90	5	17
AVC-4-10-80	850	1500	2	5	850	1500	1	3	400	900	4	11
AVC-4-10-108	300	630	2	7	300	630	2	6	150	300	5	14
AVC-4-13-102	1000	2500	2	8	1000	2500	2	5	500	1000	5	13
AVC-6-7-82	200	450	2	6	200	450	2	5	100	230	3	11
AVC-6-8-67	600	1000	2	4	600	1000	2	3	300	600	3	8
AVC-6-10-80	1500	2500	2	5	1500	2500	1	3	750	1400	5	11
AVC-6-13-135	850	1500	4	11	850	1500	4	11	300	800	6	21
AVC-8-13-120	1500	3000	4	11	1500	3000	3	7	600	1500	7	19

The min. load is the value below which the vibration damper is not able to isolate the vibrations as it would be too rigid.
The max load is the value beyond which some type of failure may occur compromising the functionality of the vibration damper.
The min.deflection is the compression of the vibration-damping support corresponding to the min. load.
The max.deflection is the compression of the vibration-damping support corresponding to the max. load.

Vibration damping elements

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AVC

Wire rope vibration damper

AVC-4-4-53

AVC-4-6-61....AVC-4-13-102
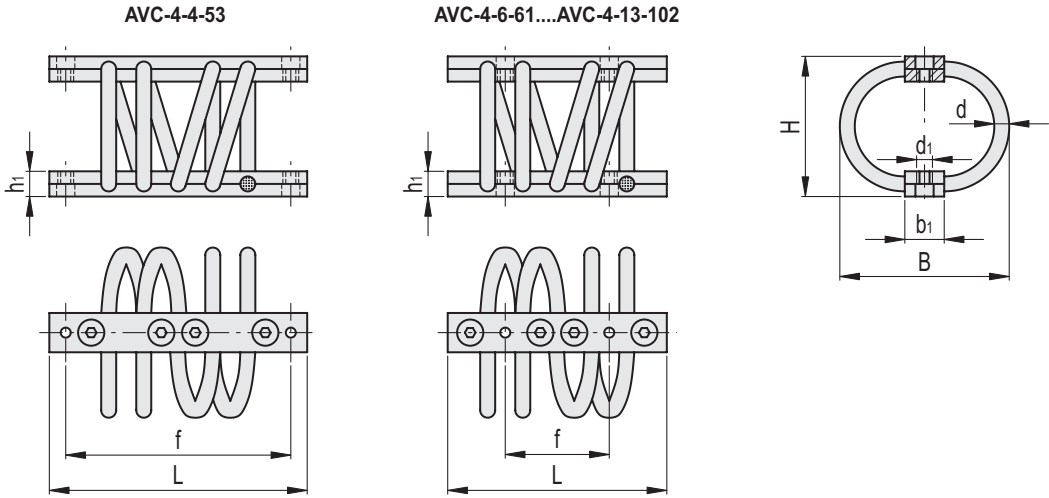
AVC-4   STAINLESS STEEL

Code	Description	B	L	H	d	d1	b1	h1	f	⚖
480001	AVC-4-4-53	53 ±3	71	45 ±3	4	M6	15	8	61	180
480003	AVC-4-6-61	61 ±3	91	51 ±3	6	M6	15	12	46	370
480005	AVC-4-6-93	90 ±4	91	65 ±4	6	M6	15	12	46	420
480007	AVC-4-7-110	110 ±4	91	79 ±4	7	M6	15	12	46	500
480009	AVC-4-10-80	80 ±4	155	68 ±4	10	M8	25	16	83	1280
480011	AVC-4-10-108	108 ±4	155	89 ±4	10	M8	25	16	83	1430
480013	AVC-4-13-102	101 ±4	155	80 ±4	13	M8	25	20	83	1760

AVC-6
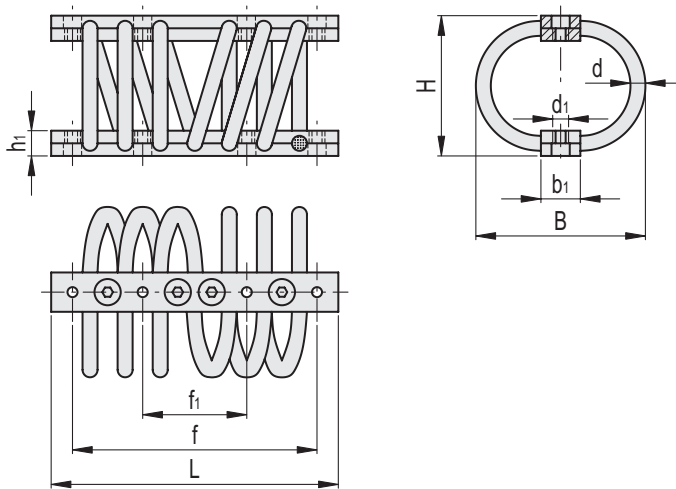
AVC-6   STAINLESS STEEL

Code	Description	B	L	H	d	d1	b1	h1	f	f1	⚖
480021	AVC-6-7-82	82 ±4	200	60 ±4	7	M6	15	12	66	155	870
480023	AVC-6-8-67	67 ±4	200	53 ±4	8	M6	15	12	66	155	870
480025	AVC-6-10-80	80 ±4	169	68 ±4	10	M6	25	16	66	155	1490
480027	AVC-6-13-135	135 ±5	178	110 ±5	13	M8	25	20	66,6	155,5	2610

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Vibration damping elements

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Vibration damping elements
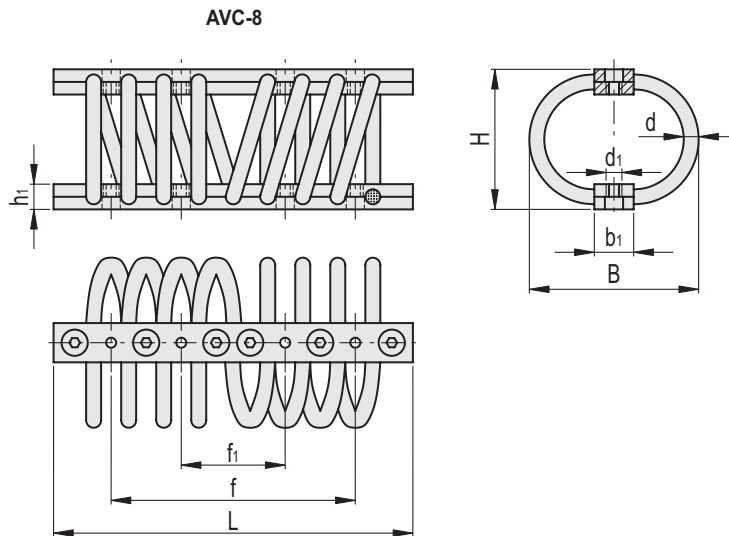
AVC-8

AVC-8   **STAINLESS STEEL**

Code	Description	B	L	H	d	d1	b1	h1	f	f1	⚖
480029	AVC-8-13-120	118 ±4	222	95 ±4	13	M6	25	20	66	155	3040

HIGH PERFORMANCE VIBRATION DAMPERS

General information

High performance vibration dampers are used in compliance with safety regulations on vibrations and noise (DL 81/2008). The use of this product range allows: to prevent damage to structures, to preserve the correct operation of sensitive equipment, to reduce noise.

Features

AVC:

- High static deflection, low resonance frequency and high vibration isolation.
- High damping factor, also suitable for unbalanced machines.
- Suitable for use with with compression, traction and shear.
- Suitable for applications where impacts and shocks may occur.
- Structure fully made out of stainless steel, resistant to flames, high temperatures and corrosion.

AVM:

- High static deflection depending on height, low resonance frequency and high vibration isolation
- No damping factor, therefore not suitable for unbalanced machines.
- Suitable for use with with compression.
- Stainless steel springs must be used for temperatures below +5°C (special execution on request).

AVG:

- Good static deflection, low resonance frequency and good vibration isolation.
- High damping factor, also suitable for unbalanced machines.
- Suitable for use with with compression and traction.
- High safety degree: even in the case of the combustion of rubber resilient, the inner pin cannot come out of the structure and keeps the equipmnent securely suspended.

Guidelines for the choice

Analysis of the static tests to select the appropriate vibration damper.

Basic data required:

- The static load applied to each vibration damping element (acting on each support point).
- Disturbing frequency to be reduced and the desired isolation percentage.

How to choose the vibration-damping element:

- With reference to the diagram for the check of the degree of isolation, locate the corresponding static deflection required to obtain the desired isolation.
- Select the product with the required static deflection depending on acting load.

Example:

Consider an application with the following features:
- Static load on each support: 1400 N
- Frequency to be isolated: 1.200 rpm = 20 Hz
- Required isolation: 90% at 20 Hz

For vibration dampers without damping e.g. AVM, the following diagram for checking the isolation degree shows that a static deflection of at least 7 mm is required to obtain 90% isolation of the 20 Hz frequency, In case of damping, the isolation percentage may vary, it is advisable to contact the Elesa Technical Department.

HIGH PERFORMANCE VIBRATION DAMPERS

Diagram for checking the isolation degree of the vibration-damping element
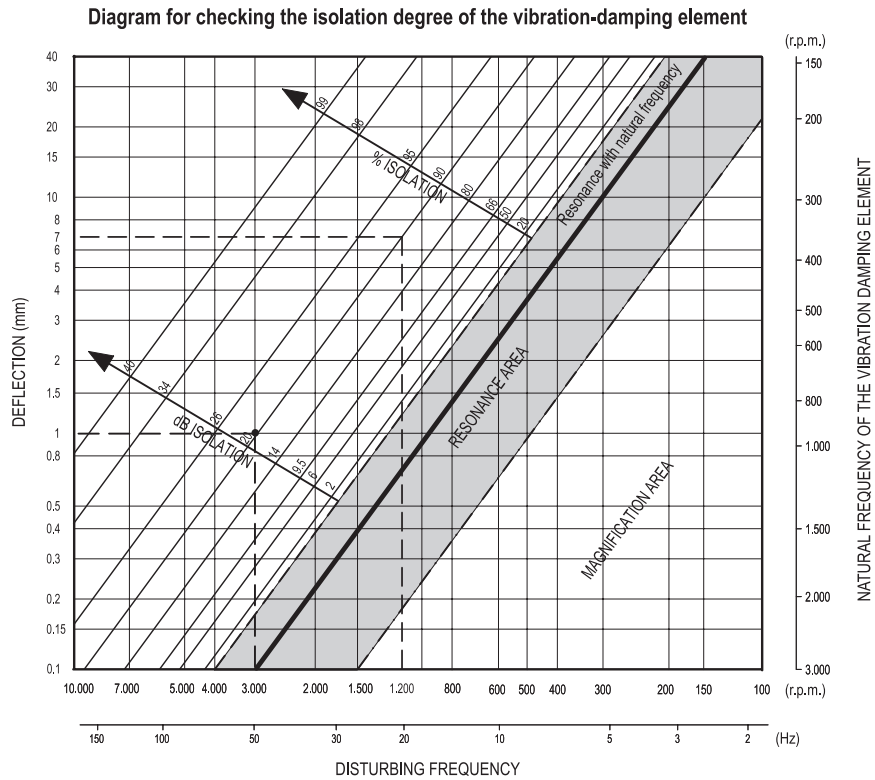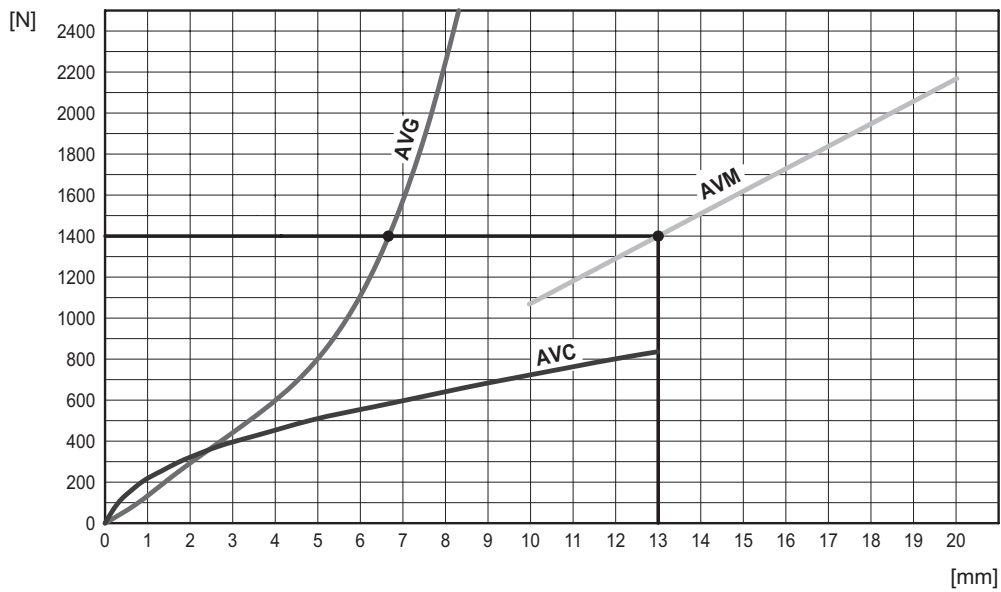

With reference to the graph below the products that intersect the 1400 N line are: AVG, AVM.
For the 1400 N load, the expected static deflections are:

- AVG: 6.5 mm (< 7 mm) = approximately 88% isolation at 20 Hz
- AVM: 13 mm (< 7 mm) = approximately 95% isolation at 20 Hz

Consequently, the most suitable product with the best isolation degree is AVM.

Example of load diagrams

HIGH PERFORMANCE VIBRATION DAMPERS

Simplified diagram for the check of the degree of isolation of a vibration damper

Defl. [mm]	f0v [Hz]	Isolation %															
1	15.9	-1%	-5%	-11%	-21%	-38%	-65%	-116%	-235%	-795%	-935%	-73%	32%	70%	89%	94%	96%
1.5	13.0	-2%	-7%	-17%	-36%	-70%	-145%	-416%	-1795%	-201%	-55%	27%	63%	82%	93%	96%	98%
2	11.3	-2%	-10%	-25%	-54%	-121%	-375%	-1239%	-148%	-29%	16%	54%	75%	87%	95%	97%	98%
2.5	10.1	-3%	-12%	-33%	-78%	-218%	-7569%	-191%	-33%	18%	43%	66%	81%	90%	96%	98%	99%
3	9.2	-3%	-15%	-42%	-111%	-463%	-442%	-63%	10%	40%	56%	73%	84%	92%	97%	98%	99%
4	8.0	-5%	-21%	-65%	-235%	-935%	-73%	13%	45%	61%	70%	81%	89%	94%	97%	99%	99%
5	7.1	-6%	-28%	-97%	-715%	-170%	-3%	41%	60%	71%	78%	85%	91%	95%	98%	99%	99%
6	6.5	-7%	-36%	-145%	-1795%	-55%	27%	55%	69%	77%	82%	88%	93%	96%	98%	99%	99%
7	6.0	-8%	-44%	-223%	-338%	-9%	43%	64%	74%	81%	85%	90%	94%	97%	99%	99%	99%
8	5.6	-10%	-54%	-375%	-148%	16%	54%	70%	78%	84%	87%	91%	95%	97%	99%	99%	Max
10	5.0	-12%	-78%	-7569%	-33%	43%	66%	77%	83%	87%	90%	93%	96%	98%	99%	99%	Max
12	4.6	-15%	-111%	-442%	10%	56%	73%	82%	87%	90%	92%	94%	97%	98%	99%	Max	Max
14	4.3	-18%	-159%	-162%	31%	65%	78%	85%	89%	91%	93%	95%	97%	98%	99%	Max	Max
16	4.0	-21%	-235%	-73%	45%	70%	81%	87%	90%	92%	94%	96%	97%	99%	99%	Max	Max
18	3.8	-25%	-375%	-29%	54%	75%	84%	88%	91%	93%	95%	96%	98%	99%	99%	Max	Max
20	3.6	-28%	-715%	-3%	60%	78%	85%	90%	92%	94%	95%	97%	98%	99%	99%	Max	Max
22	3.4	-32%	-2759%	15%	65%	80%	87%	91%	93%	95%	96%	97%	98%	99%	Max	Max	Max
25	3.2	-38%	-935%	32%	70%	83%	89%	92%	94%	95%	96%	97%	98%	99%	Max	Max	Max
30	2.9	-49%	-217%	49%	77%	86%	91%	93%	95%	96%	97%	98%	99%	99%	Max	Max	Max
32	2.8	-54%	-148%	54%	78%	87%	91%	94%	95%	96%	97%	98%	99%	99%	Max	Max	Max
35	2.7	-62%	-87%	59%	81%	88%	92%	94%	96%	97%	97%	98%	99%	99%	Max	Max	Max
40	2.5	-78%	-33%	66%	83%	90%	93%	95%	96%	97%	98%	98%	99%	99%	Max	Max	Max
45	2.4	-97%	-3%	71%	85%	91%	94%	96%	97%	97%	98%	99%	99%	99%	Max	Max	Max
50	2.3	-121%	16%	75%	87%	92%	95%	96%	97%	98%	98%	99%	99%	Max	Max	Max	Max
55	2.1	-152%	29%	77%	88%	93%	95%	96%	97%	98%	98%	99%	99%	Max	Max	Max	Max
60	2.1	-192%	39%	80%	90%	94%	96%	97%	98%	98%	98%	99%	99%	Max	Max	Max	Max
70	1.9	-330%	52%	83%	91%	95%	96%	97%	98%	98%	99%	99%	99%	Max	Max	Max	Max
80	1.8	-715%	60%	85%	92%	95%	97%	98%	98%	99%	99%	99%	99%	Max	Max	Max	Max
90	1.7	-7569%	66%	87%	93%	96%	97%	98%	98%	99%	99%	99%	Max	Max	Max	Max	Max
100	1.6	-935%	70%	89%	94%	96%	97%	98%	99%	99%	99%	99%	Max	Max	Max	Max	Max
150	1.3	-55%	82%	93%	96%	98%	98%	99%	99%	99%	99%	Max	Max	Max	Max	Max	Max
200	1.1	16%	87%	95%	97%	98%	99%	99%	99%	99%	Max	Max	Max	Max	Max	Max	Max
RPM		100	200	300	400	500	600	700	800	900	1000	1200	1500	2000	3000	4000	5000
[Hz]		1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3	15.0	16.7	20.0	25.0	33.3	50.0	66.7	83.3

No isolation		Minimum isolation	Average isolation
Resonance		Modest isolation	High isolation

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