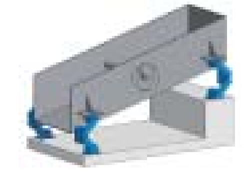
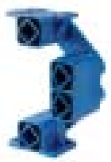
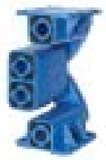
# Selection table for free oscillating systems (with unbalanced excitation)

| | |  One mass system circular motion screen |  One mass system linear motion screen |  Two mass system with counterframe |  One mass system linear motion screen hanging |
|---|---|---|---|---|---|
|  | **AB** Page 2.11 | **Oscillating Mounting** – universal mounting. High vibration isolation and low residual force transmission. Natural frequencies approx. 2–3 Hz. 9 sizes from 50 N to 20’000 N per AB. | | | |
|  | **AB-HD** Page 2.12 | **Oscillating Mounting** for impact loading and high production peaks. (Heavy Duty) Natural frequencies approx. 2.5–3.5 Hz. 6 sizes from 500 N to 14’000 N per AB-HD. | | | |
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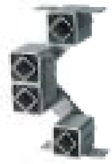
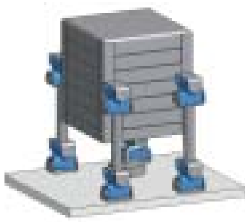
|  | **ABI** Page 2.14 | **Oscillating Mounting** made from stainless steel for the food and pharmaceutical industry. High vibration isolation and low residual force transmission. Natural frequencies approx. 2–3 Hz. 6 sizes from 70 N to 6’800 N per ABI. | | | |
|  | **HS** Page 2.15 | | | | **Oscillating Mounting** for hanging systems. Natural frequencies approx. 3–4 Hz. 5 sizes from 500 N to 14’000 N per HS. |

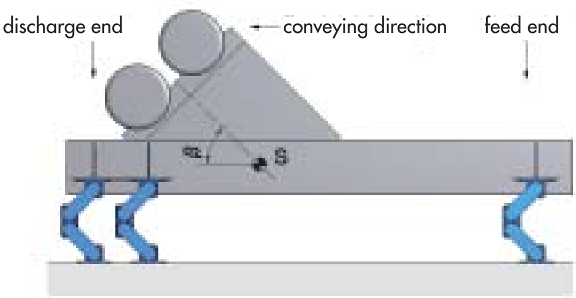
# Selection table for gyratory sifters

| | | | | |
|---|---|---|---|---|
|  | **AK** Page 2.36 | **Universal Joint** for the support or suspension of positive drive or freely oscillating gyratory sifting machines. 10 sizes up to 40’000 N per AK. | Gyratory sifter upright staying  | Gyratory sifter hanging  |
|  | **AV** Page 2.38 | **Single Joint** specially designed with large rubber volume for the suspension of gyratory sifting machines. Models with right-hand and left-hand threads. 5 sizes up to 16’000 N per AV. | | |

# Technology

## Design layout and evaluation

| Subject | Symbol | • Example |
|---|---|---|
| Mass of the empty channel and drive | $m_0$ | 680 kg |
| Products on the channel | | 200 kg |
| of which approx. 50% coupling * | | 100 kg |
| Total vibrating mass * | m | 780 kg |
| Mass distribution: feed end | % feed end | 33% |
| discharge end | % discharge end | 67% |
| Acceleration due to gravity | g | 9.81 $m/s^2$ |
| Load per corner feed end | $F_{feed\ end}$ | 1263 N |
| Load per corner discharge end | $F_{discharge\ end}$ | 2563 N |
| **• Element choice in example** | | **6x AB 38** |
| Working torque of both drives | AM | 600 kgcm |
| Oscillating stroke empty channel | $sw_0$ | 8.8 mm |
| Oscillating stroke in operation | sw | 7.7 mm |
| Motor revolutions | $n_s$ | 960 rpm |
| Centrifugal force of both drives | Fz | 30'319 N |
| Oscillating machine factor | K | 4.0 |
| Machine acceleration | $a = K \cdot g$ | 4.0 g |
| **• Natural frequency suspensions** | **fe** | **2.7 Hz** |
| Degree of isolation | W | 97% |




### Calculation formulas

**Loading per corner**

$$F_{feed\text{-}end} = \frac{m \cdot g \cdot \%\ feed\text{-}end}{2 \cdot 100} \qquad F_{discharge\text{-}end} = \frac{m \cdot g \cdot \%\ discharge\text{-}end}{2 \cdot 100}$$

**Oscillating stroke (Amplitude peak to peak)**

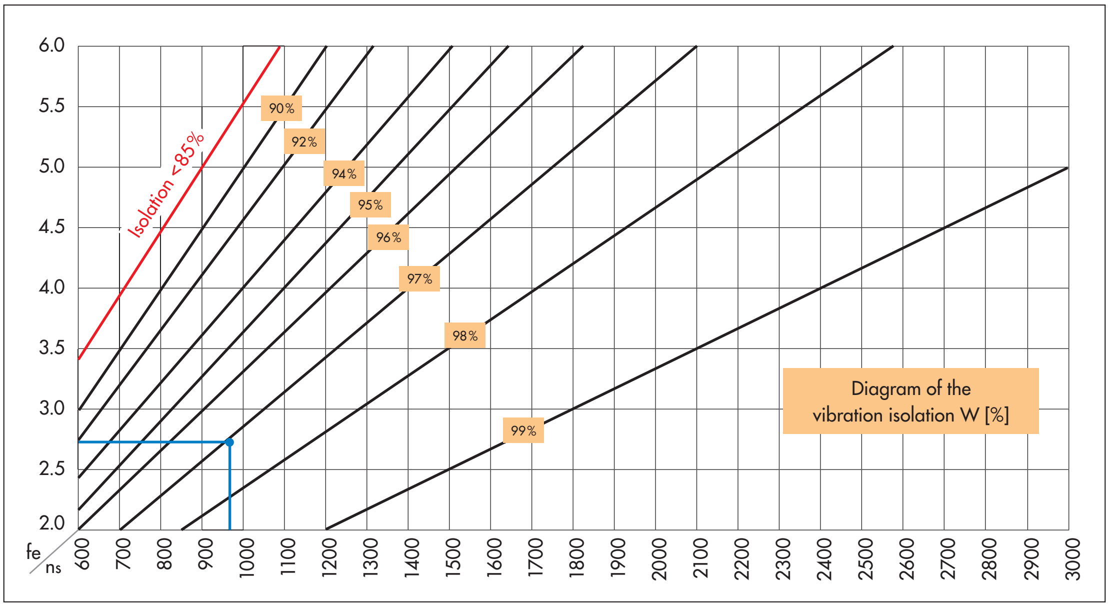
$$sw_0 = \frac{AM}{m_0} \cdot 10 \qquad sw = \frac{AM}{m} \cdot 10$$

**Centrifugal force**

$$F_z = \frac{\left(\frac{2\pi}{60} \cdot n_s\right)^2 \cdot AM \cdot 10}{2 \cdot 1000} = \frac{n_s^2 \cdot AM}{18'240}$$

**Oscillating machine factor**

$$K = \frac{\left(\frac{2\pi}{60} \cdot n_s\right)^2 \cdot sw}{2 \cdot g \cdot 1000} = \frac{n_s^2 \cdot sw}{1'789'000}$$




**Vibration isolation**

$$W = 100 - \frac{100}{\left(\frac{n_s}{60 \cdot f\,e}\right)^2 - 1}$$

**• Example:**
The proportion of the relationship between exciter frequency 16 Hz (960 rpm) and mount frequency 2.7 Hz is offering a degree of isolation of 97%.

* The following has to be observed for the determination of the coupling effect and material flow:
– High coupling or sticking of humid bulk material
– Channel running full
– Fully stacked screen deck with humid material
– Weight distribution with and without conveyed material
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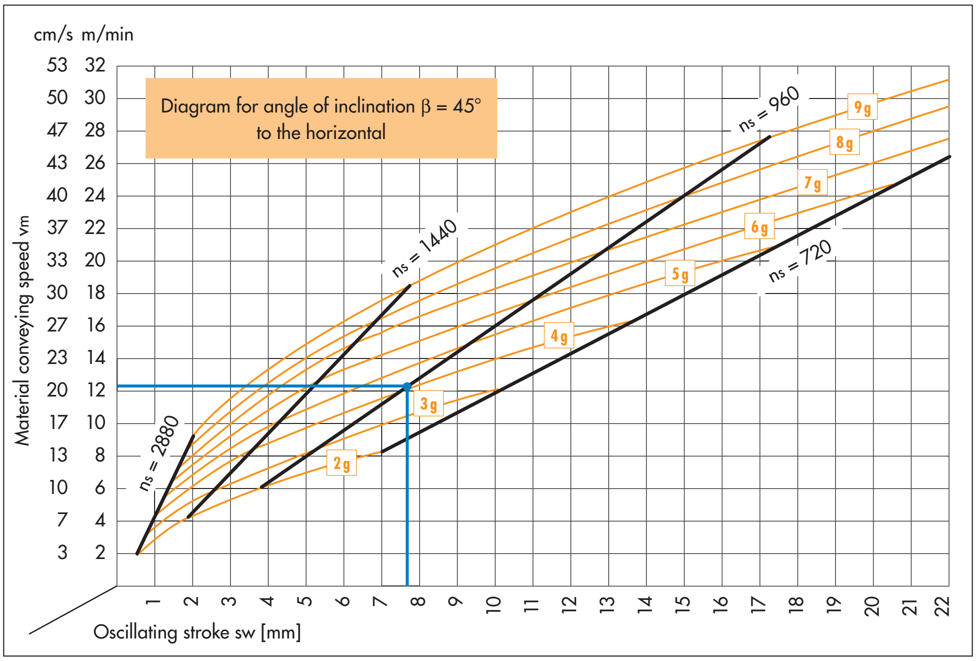
# Technology

## Determination of the average material conveying speed vm




### Main influencing factors:

- Conveying ability of the material
- Height of the bulk goods
- Screen box inclination
- Position of unbalanced motors
- Position of the center of gravity

The material speed on circular motion screens does vary, due to differing screen-box inclination angles.

- **Example:**

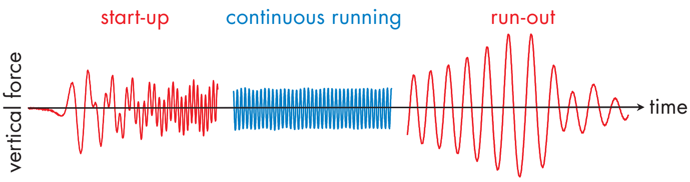
The horizontal line out of the intercept point of stroke (7.7 mm) and motor revolutions (960 rpm) is indicating an average theoretical speed of 12.3 m/min or 20.5 cm/sec.



## Resonance amplification and continuous running

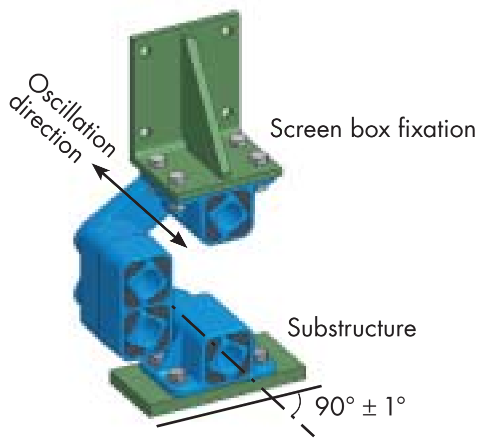
At the screen start-up and run-out the suspension elements are passing through the resonance frequency. By the resulting amplitude superelevation the four rubber suspensions in the AB mountings do generate a high level of damping which is absorbing the remaining energy after only a few strokes. The screen box stops its motion within seconds.

Laboratory measurements of a typical development of the residual forces on a ROSTA screen suspension:

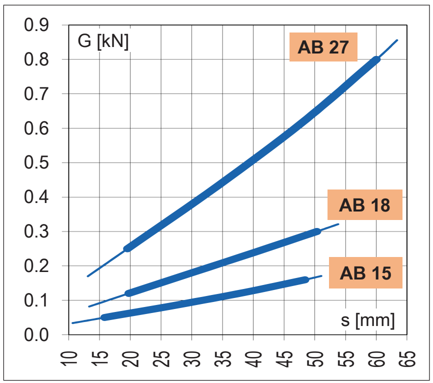


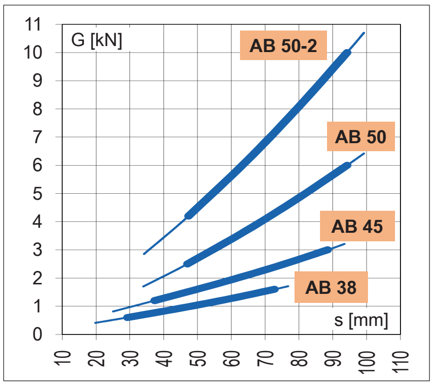

## Alignment of the elements

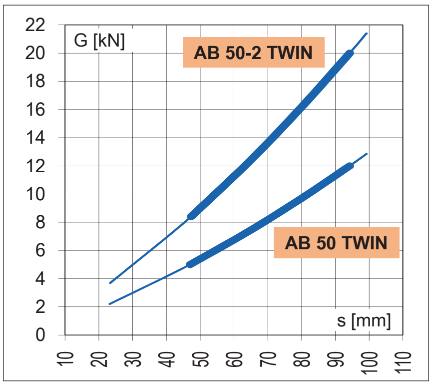
If the suspensions for linear motion screens are arranged as shown on page 2.7, a harmonic, noiseless oscillation of the screen will result. The rocker arm fixed to the screen carries out the greater part of the oscillations. The rocker arm fixed to the substructure remains virtually stationary and ensures a low natural frequency, and thereby also a good vibration isolation. The mounting axis has to be arranged to be at right angles (90°) to the conveying axis, with maximum tolerance of ±1°.



**Compression load AB**



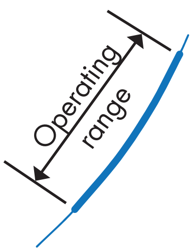




## Deflection curves and cold flow behaviours

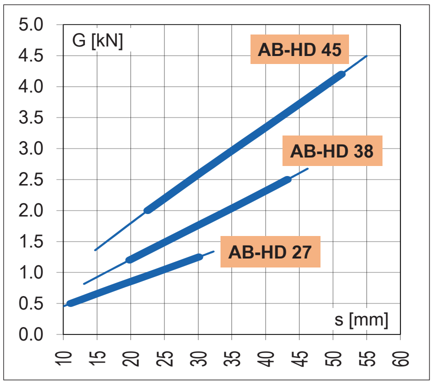
Diagrams showing the vertical deflection **s** (in mm) by compression or tensile load **G** (in kN). The shown values comprehend the **initial cold flow settling** after one day of operation. The final element deflection after the full cold flow compensation (after approx. 1 year) is usually factor x 1,09 higher (depending on specific application, climate etc.).

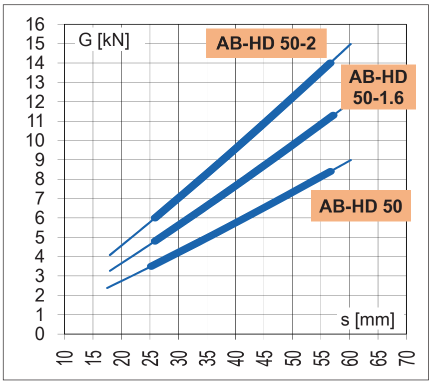
**Final element deflection = s x 1,09**

The deflection values are based on our catalogue specifications and should be understood as approximate values. Please consult also our tolerance specifications in chapter "Technology" in the general catalogue.

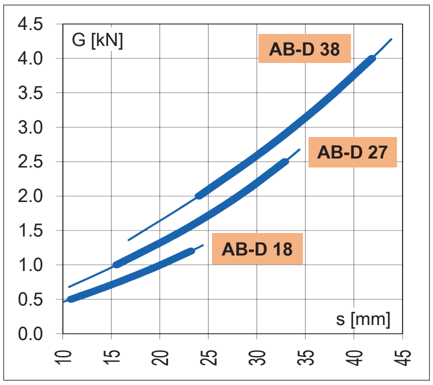


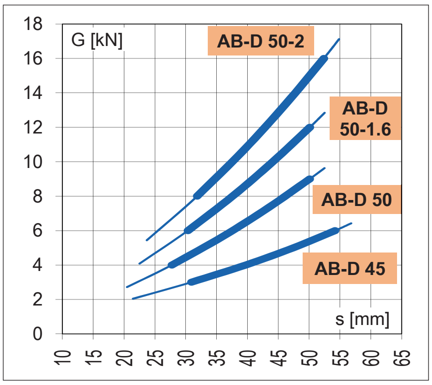

**Compression load AB-HD**



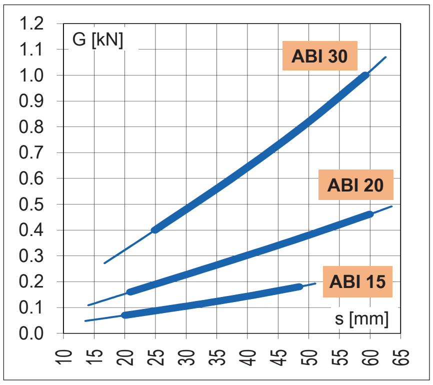



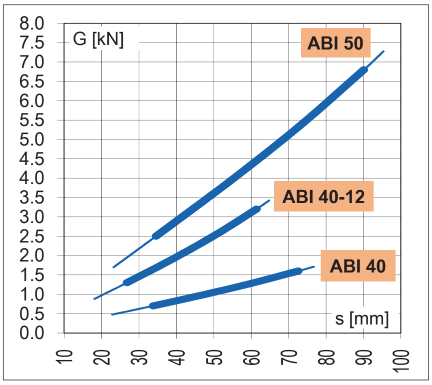

**Compression load AB-D**



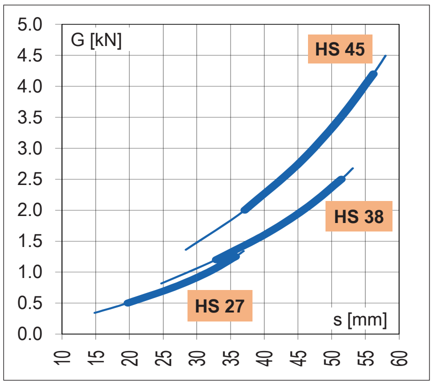



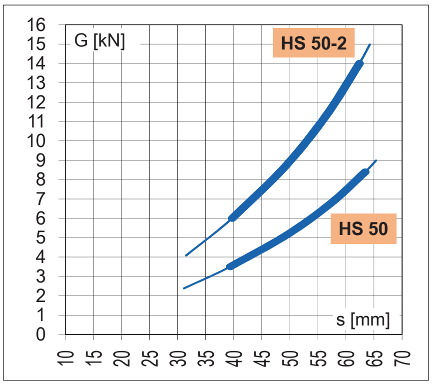

**Compression load ABI**



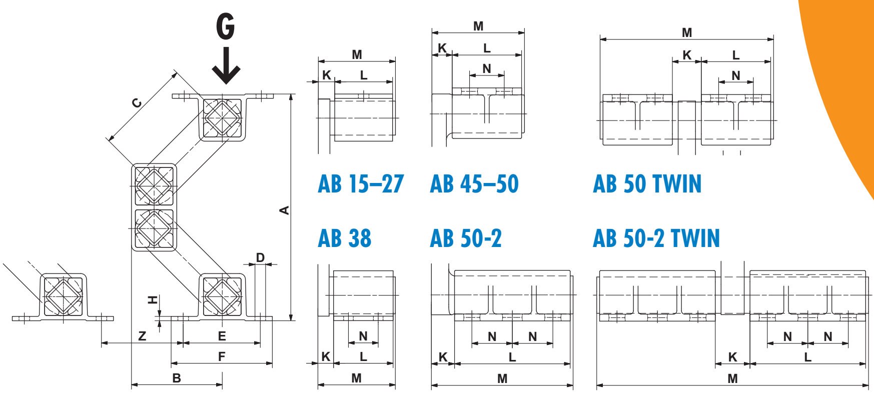

**Tensile load HS**



# Oscillating Mountings

## Type AB




| Art. No. | Type | Load capacity Gmin.–Gmax. [N] | A un-loaded | A* max. load | B un-loaded | B* max. load | C | D | E | F | H | K | L | M | N | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07 051 056 | **AB 15** | 50 – 160 | 169 | 115 | 71 | 89 | 80 | ⌀7 | 50 | 65 | 9 | 10 | 40 | 52 | – | 0.5 |
| 07 051 057 | **AB 18** | 120 – 300 | 208 | 154 | 88 | 107 | 100 | ⌀9 | 60 | 80 | 3.5 | 14 | 50 | 67 | – | 1.2 |
| 07 051 058 | **AB 27** | 250 – 800 | 235 | 170 | 94 | 116 | 100 | ⌀11 | 80 | 105 | 4.5 | 17 | 60 | 80 | – | 2.2 |
| 07 051 059 | **AB 38** | 600 – 1'600 | 305 | 225 | 120 | 147 | 125 | ⌀13 | 100 | 125 | 6 | 21 | 80 | 104 | 40 | 5.1 |
| 07 051 054 | **AB 45** | 1'200 – 3'000 | 353 | 257 | 141 | 172 | 140 | 13x20 | 115 | 145 | 8 | 28 | 100 | 132 | 65 | 11.5 |
| 07 051 061 | **AB 50** | 2'500 – 6'000 | 380 | 277 | 150 | 184 | 150 | 17x27 | 130 | 170 | 12 | 35 | 120 | 160 | 60 | 20.8 |
| 07 051 055 | **AB 50-2** | 4'200 – 10'000 | 380 | 277 | 150 | 184 | 150 | 17x27 | 130 | 170 | 12 | 40 | 200 | 245 | 70 | 32.2 |
| 07 051 008 | **AB 50 TWIN** | 5'000 – 12'000 | 380 | 277 | 150 | 184 | 150 | 17x27 | 130 | 170 | 12 | 50 | 120 | 300 | 60 | 35.0 |
| 07 051 009 | **AB 50-2 TWIN** | 8'400 – 20'000 | 380 | 277 | 150 | 184 | 150 | 17x27 | 130 | 170 | 12 | 60 | 200 | 470 | 70 | 54.0 |

| Art. No. | Type | Natural frequency Gmin.–Gmax. [Hz] | Z** | Dynamic spring value: cd vertical [N/mm] | cd horizontal [N/mm] | Capacity limits by different rpm: 720 $\text{min}^{-1}$ sw max. [mm] | K max. [–] | 960 $\text{min}^{-1}$ sw max. [mm] | K max. [–] | 1440 $\text{min}^{-1}$ sw max. [mm] | K max. [–] | Light metal profile | Steel welded construction | Nodular cast iron | ROSTA blue painted |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07 051 056 | **AB 15** | 4.3–2.8 | 65 | 10 | 6 | 14 | 4.1 | 12 | 6.2 | 8 | 9.3 | x | x | | x |
| 07 051 057 | **AB 18** | 3.6–2.6 | 80 | 18 | 14 | 17 | 4.9 | 15 | 7.7 | 8 | 9.3 | x | x | | x |
| 07 051 058 | **AB 27** | 3.7–2.7 | 80 | 40 | 25 | 17 | 4.9 | 14 | 7.2 | 8 | 9.3 | x | x | | x |
| 07 051 059 | **AB 38** | 3.0–2.4 | 100 | 60 | 30 | 20 | 5.8 | 17 | 8.8 | 8 | 9.3 | x | x | | x |
| 07 051 054 | **AB 45** | 2.8–2.3 | 115 | 100 | 50 | 21 | 6.1 | 18 | 9.3 | 8 | 9.3 | x | x | x | x |
| 07 051 061 | **AB 50** | 2.4–2.1 | 140 | 190 | 85 | 22 | 6.4 | 18 | 9.3 | 8 | 9.3 | | | x | x |
| 07 051 055 | **AB 50-2** | 2.4–2.1 | 140 | 320 | 140 | 22 | 6.4 | 18 | 9.3 | 8 | 9.3 | | | x | x |
| 07 051 008 | **AB 50 TWIN** | 2.4–2.1 | 140 | 380 | 170 | 22 | 6.4 | 18 | 9.3 | 8 | 9.3 | | x | x | x |
| 07 051 009 | **AB 50-2 TWIN** | 2.4–2.1 | 140 | 640 | 280 | 22 | 6.4 | 18 | 9.3 | 8 | 9.3 | | x | x | x |
| | | | | Values in nominal load range at 960 rpm and sw of 8 mm | | Acceleration > 9.3 g is not recommended | | | | | | Material structure | | | |

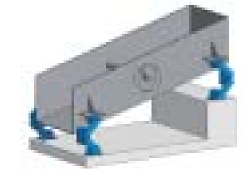
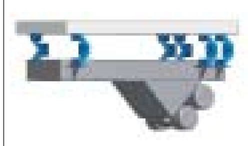
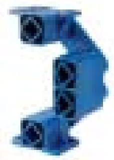
These types can be combined with one another (identical heights and operation behaviour)


* compression load Gmax. and final cold flow compensation (after approx. 1 year).
** separate assembly instructions are available, please ask for details.

ROSTA
www.rosta.com

Oscillating Mountings

# Selection table for free oscillating systems (with unbalanced excitation)

| | |  One mass system circular motion screen |  One mass system linear motion screen |  Two mass system with counterframe |  One mass system linear motion screen hanging |
|---|---|---|---|---|---|
|  | **AB** Page 2.11 | **Oscillating Mounting** – universal mounting. High vibration isolation and low residual force transmission. Natural frequencies approx. 2–3 Hz. 9 sizes from 50 N to 20'000 N per AB. | | | |
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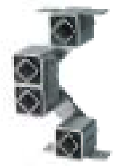
|  | **ABI** Page 2.14 | **Oscillating Mounting** made from stainless steel for the food and pharmaceutical industry. High vibration isolation and low residual force transmission. Natural frequencies approx. 2–3 Hz. 6 sizes from 70 N to 6'800 N per ABI. | | | |
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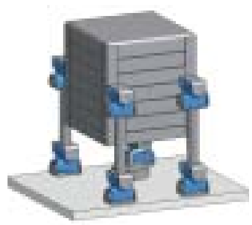
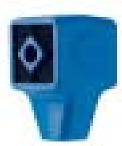
|  | **AK** Page 2.36 | **Universal Joint** for the support or suspension of positive drive or freely oscillating gyratory sifting machines. 10 sizes up to 40'000 N per AK. |  |  |
|  | **AV** Page 2.38 | **Single Joint** specially designed with large rubber volume for the suspension of gyratory sifting machines. Models with right-hand and left-hand threads. 5 sizes up to 16'000 N per AV. | | |

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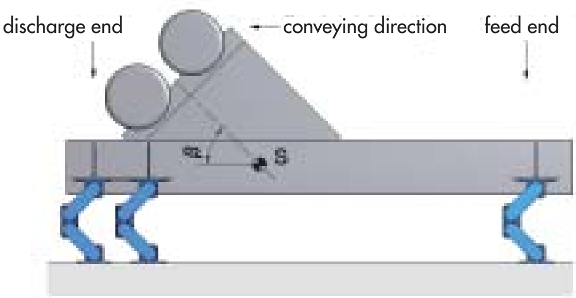


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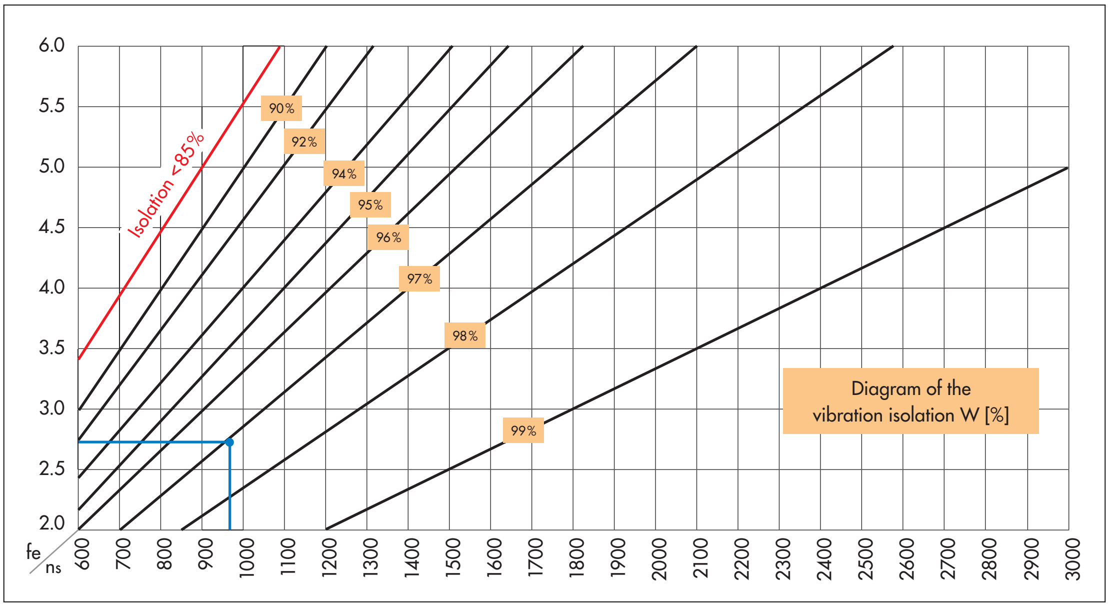


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# Technology

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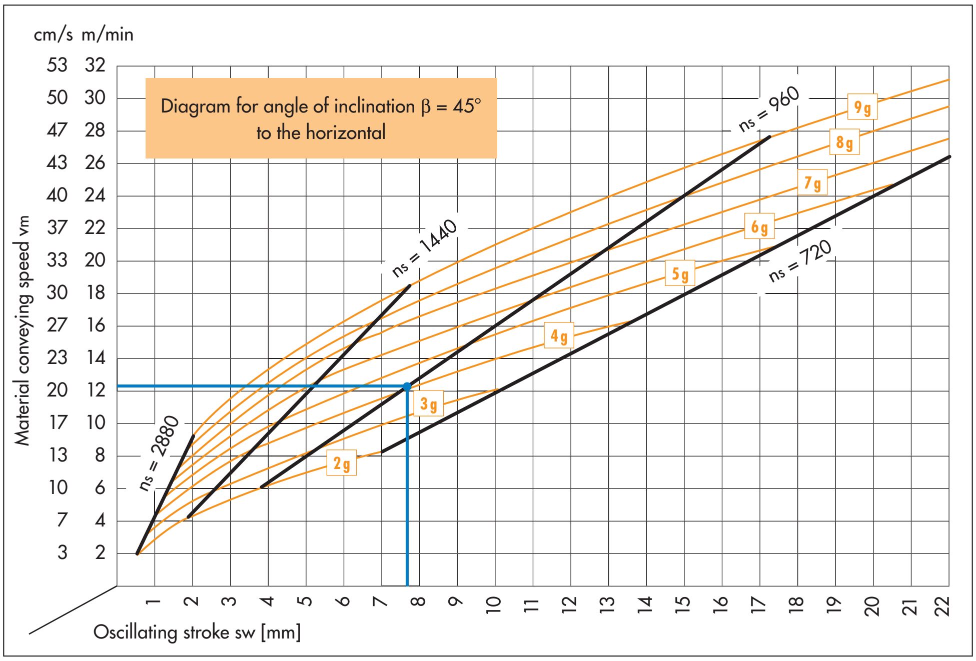


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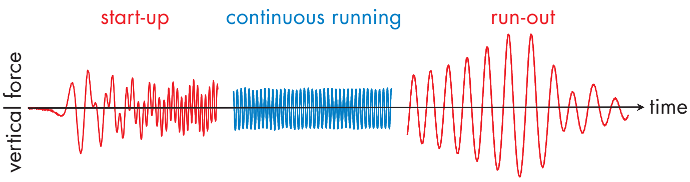
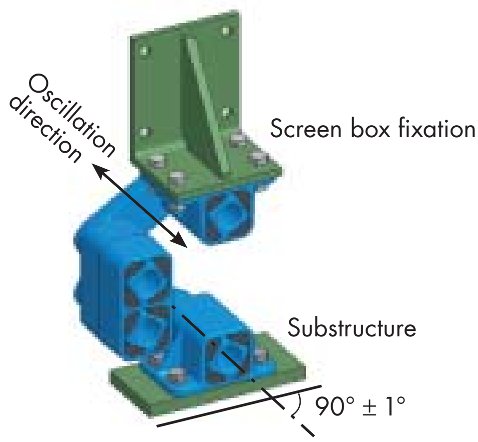
Laboratory measurements of a typical development of the residual forces on a ROSTA screen suspension:

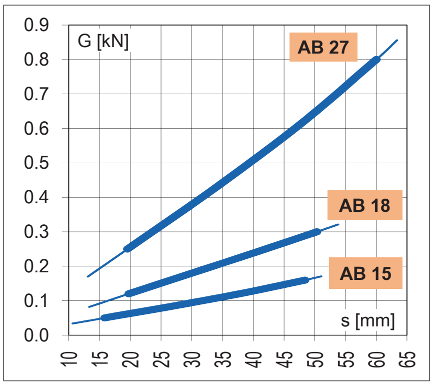


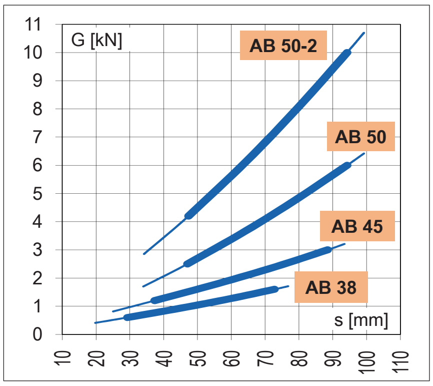

## Alignment of the elements

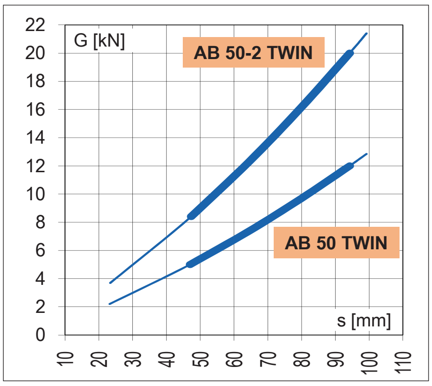
If the suspensions for linear motion screens are arranged as shown on page 2.7, a harmonic, noiseless oscillation of the screen will result. The rocker arm fixed to the screen carries out the greater part of the oscillations. The rocker arm fixed to the substructure remains virtually stationary and ensures a low natural frequency, and thereby also a good vibration isolation. The mounting axis has to be arranged to be at right angles (90°) to the conveying axis, with maximum tolerance of ±1°.



Compression load AB



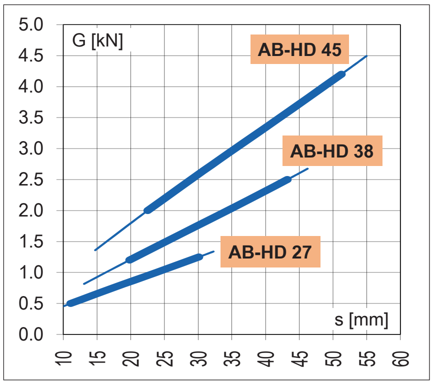

## Deflection curves and cold flow behaviours

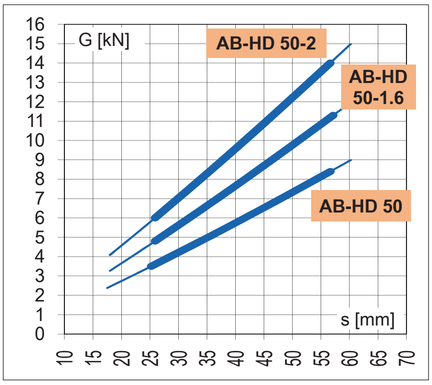
Diagrams showing the vertical deflection **s** (in mm) by compression or tensile load **G** (in kN). The shown values comprehend the **initial cold flow settling** after one day of operation. The final element deflection after the full cold flow compensation (after approx. 1 year) is usually factor x 1,09 higher (depending on specific application, climate etc.).

**Final element deflection = s x 1,09**

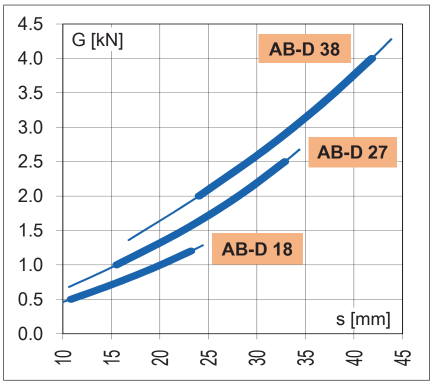
The deflection values are based on our catalogue specifications and should be understood as approximate values. Please consult also our tolerance specifications in chapter "Technology" in the general catalogue.

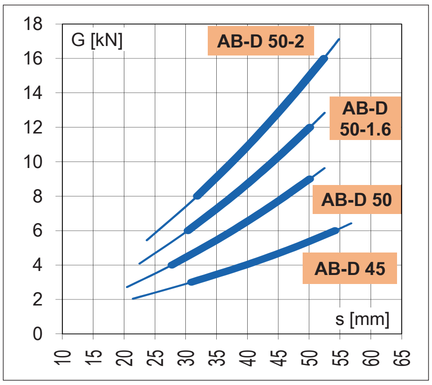
Compression load AB-HD



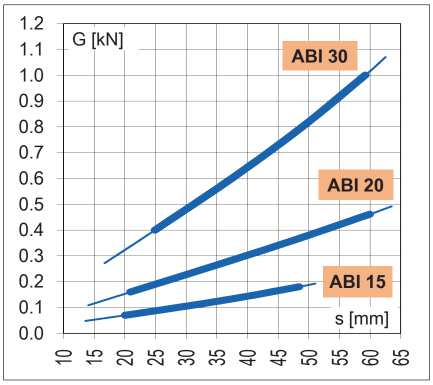



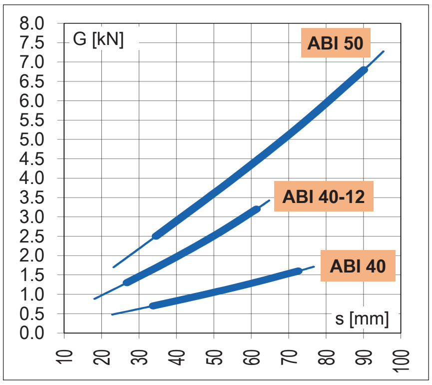

Compression load AB-D

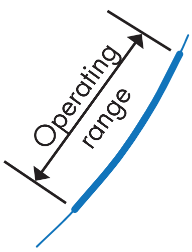


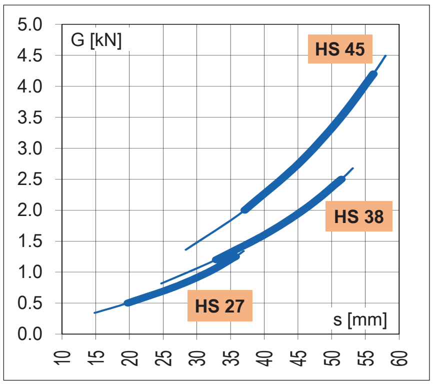

Compression load ABI

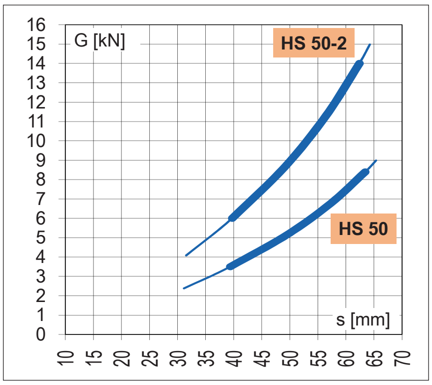



Tensile load HS

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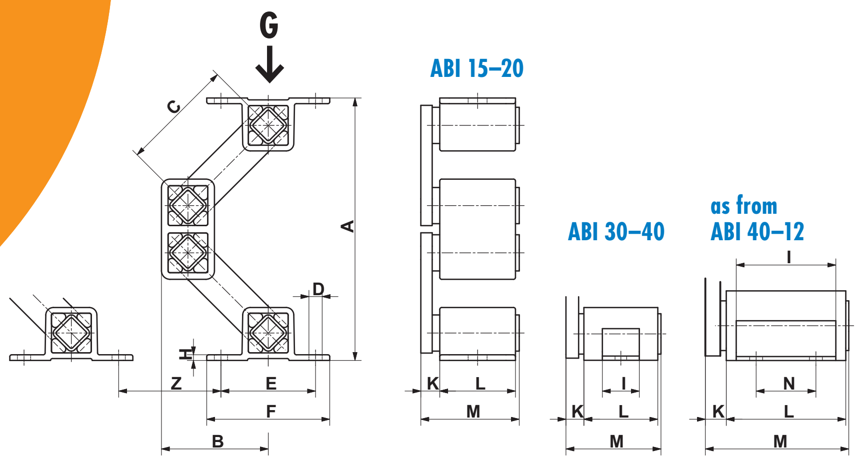
# Oscillating Mountings

## Type ABI




| Art. No. | Type | Load capacity Gmin. – Gmax. [N] | A un-loaded | A* max. load | B un-loaded | B* max. load | C | D | E | F | H | I | K | L | M | N | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07 171 107 | **ABI 15** | 70 – 180 | 167 | 114 | 70 | 88 | 80 | 7 x 10 | 50 | 65 | 3 | – | 10 | 40 | 52 | – | 0.7 |
| 07 171 108 | **ABI 20** | 160 – 460 | 214 | 147 | 89 | 111 | 100 | 9 x 15 | 65 | 85 | 3 | – | 14 | 50 | 67 | – | 1.6 |
| 07 171 103 | **ABI 30** | 400 – 1'000 | 241 | 176 | 99 | 121 | 100 | ⌀ 11 | 85 | 110 | 4 | 35 | 17 | 70 | 90 | – | 3.3 |
| 07 171 104 | **ABI 40** | 700 – 1'600 | 317 | 237 | 128 | 155 | 125 | ⌀ 13 | 115 | 150 | 4 | 40 | 21 | 80 | 104 | – | 7.9 |
| 07 171 106 | **ABI 40-12** | 1'300 – 3'200 | 281 | 214 | 111 | 133 | 100 | ⌀ 13 | 115 | 150 | 4 | 100 | 21 | 120 | 144 | 60 | 11.3 |
| 07 171 105 | **ABI 50** | 2'500 – 6'800 | 372 | 274 | 151 | 184 | 150 | ⌀ 18 | 140 | 180 | 5 | 120 | 33 | 150 | 187 | 70 | 14.3 |

| Art. No. | Type | Natural frequency Gmin. – Gmax. [Hz] | Z** | Dynamic spring value: cd vertical [N/mm] | cd horizontal [N/mm] | Capacity limits by different rpm: 720 min⁻¹ sw max. [mm] | 720 min⁻¹ K max. [–] | 960 min⁻¹ sw max. [mm] | 960 min⁻¹ K max. [–] | 1440 min⁻¹ sw max. [mm] | 1440 min⁻¹ K max. [–] | Stainless steel welded construction | Stainless steel casting | Unpainted |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07 171 107 | **ABI 15** | 4.0–2.8 | 65 | 10 | 6 | 14 | 4.1 | 12 | 6.2 | 8 | 9.3 | x | x | x |
| 07 171 108 | **ABI 20** | 3.6–2.4 | 80 | 22 | 14 | 17 | 4.9 | 15 | 7.7 | 8 | 9.3 | x | x | x |
| 07 171 103 | **ABI 30** | 3.5–2.6 | 80 | 48 | 27 | 17 | 4.9 | 14 | 7.2 | 8 | 9.3 | x | | x |
| 07 171 104 | **ABI 40** | 3.0–2.4 | 100 | 60 | 30 | 20 | 5.8 | 17 | 8.8 | 8 | 9.3 | x | | x |
| 07 171 106 | **ABI 40-12** | 3.4–2.6 | 90 | 115 | 55 | 16 | 4.6 | 13 | 6.7 | 8 | 9.3 | x | | x |
| 07 171 105 | **ABI 50** | 2.8–2.2 | 140 | 220 | 100 | 22 | 6.4 | 18 | 9.3 | 8 | 9.3 | x | | x |
| | | | | Values in nominal load range at 960 rpm and sw of 8 mm | | Acceleration > 9.3 g is not recommended | | | | | | Material structure | | |

Description of stainless steel:
X5CrNi18-10 (1.4301) and
GX5CrNi19-10 (1.4308)

* compression load Gmax. and final cold flow compensation (after approx. 1 year).
** separate assembly instructions are available, please ask for details.

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