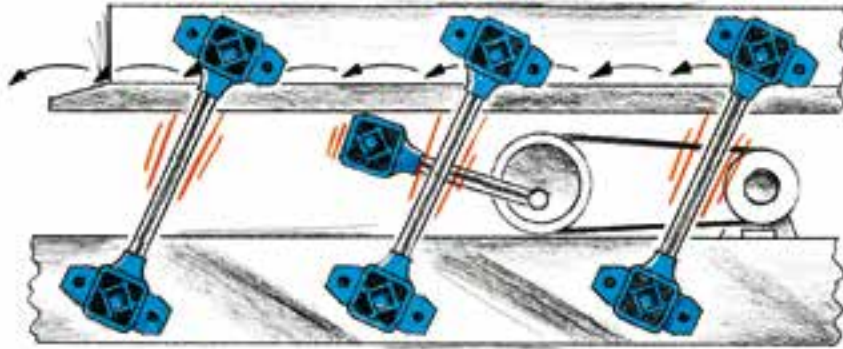


# ROSTA Oscillating Mountings

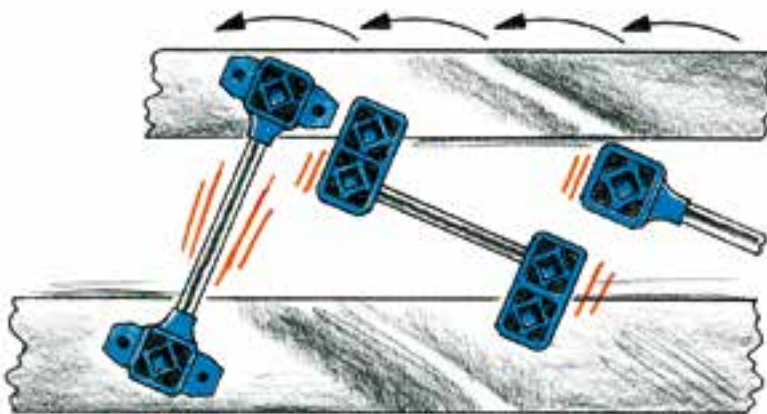
Elastic Suspensions for Screens and Shaker Conveyors  
High dampening – long lifetime – overload proof



# ROSTA Oscillating elastic suspensions for all types of screening

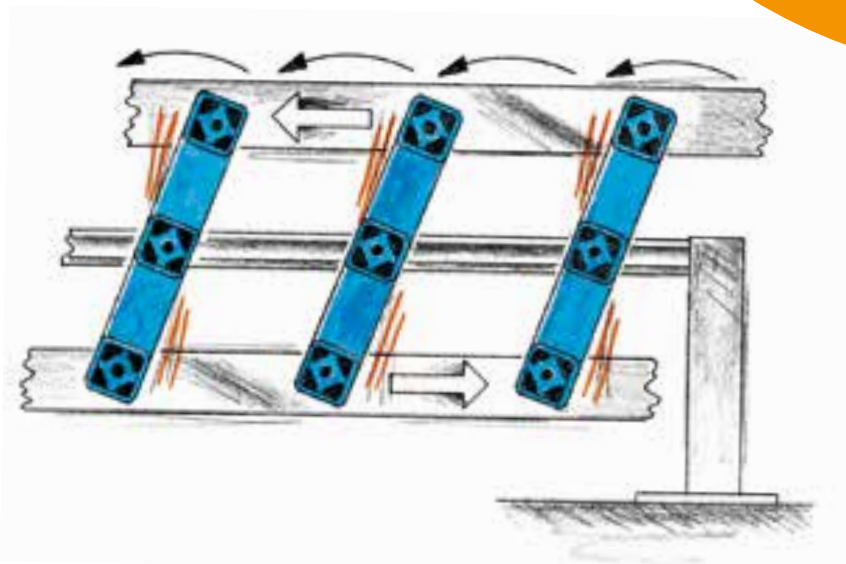


- Rocker arms and drive heads for crank shaft driven shaker conveyors**
- maintenance-free and long lasting guide arms for shakers
  - resilient rod heads for alternating loads



- Spring accumulators for natural frequency shakers**
- for the powerful, harmonic actuation of feeders
  - energy-saving and silent power packs

- Double rocker arms for high speed shaker conveyors**
- 1 : 1 mass balancing, reaction neutral suspensions
  - high dynamic spring rates for natural frequency systems



AU Rocker Arm



# Mountings

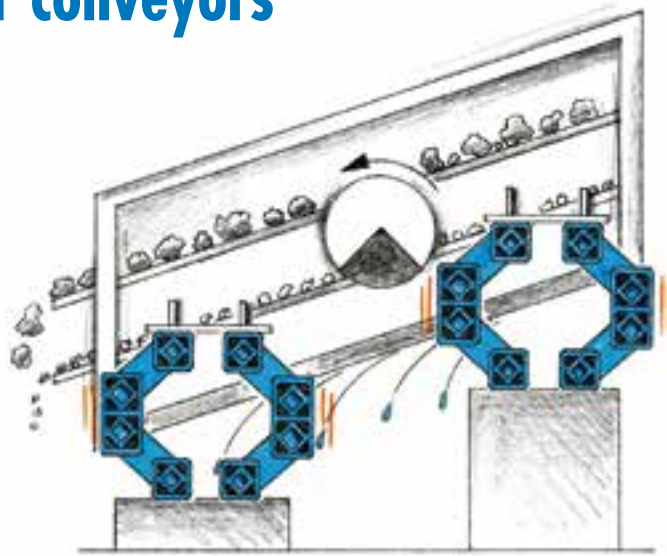
## machines and shaker conveyors



AB Screen Mount

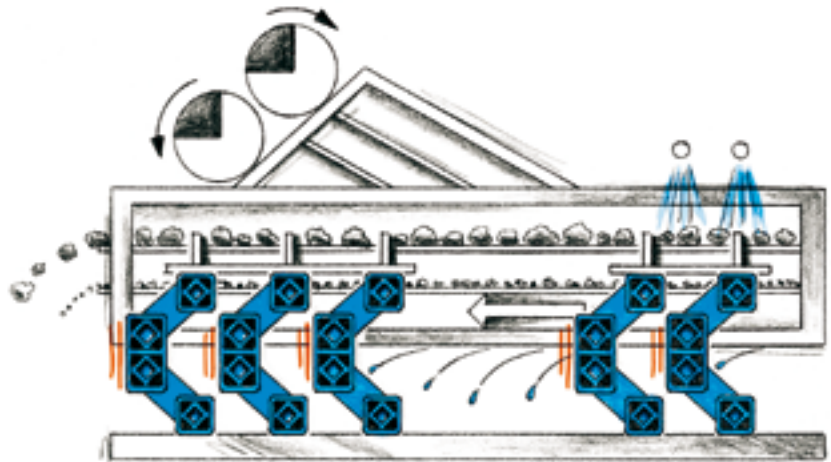
AK Universal Joint

**maintenance-free,  
long lasting, noiseless,  
corrosion-resistant  
and overload-proof for  
all oscillatory equip-  
ments and machinery**



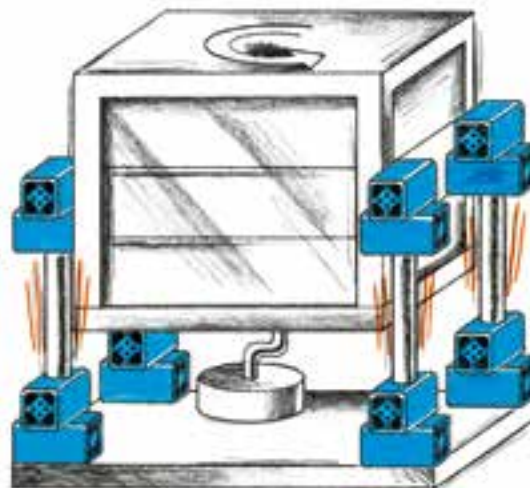
**Vibration absorbing mounts for circular and linear motion screens**

- long lasting
- high isolation degree
- corrosion-resistant
- overload-proof

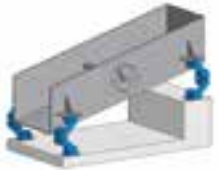


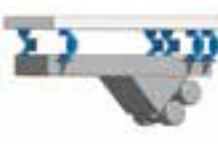






**Universal joint suspensions for  
gyratory sifters**





- long lasting articulations  
for guiding horizontal  
gyrations
- offering extremely high  
supporting force, up to  
40'000 N per mounting



# 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
	<b>AB ABI</b> Page 2.10	<b>Oscillating Mounting</b> – 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 element.			
	<b>AB-HD ABI-HD</b> Page 2.12	<b>Oscillating Mounting</b> for impact loading and high production peaks. (Heavy Duty) Natural frequencies approx. 2.5–4 Hz. 8 sizes from 150 N to 14'000 N per element.			
	<b>AB-D</b> Page 2.14		<b>Oscillating Mounting</b> in compact design. Optimal in two mass systems as counterframe mounting. Natural frequencies approx. 3–4.5 Hz. 7 sizes from 500 N to 16'000 N per AB-D.		
	<b>HS</b> Page 2.15				<b>Oscillating Mounting</b> 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

	<b>AK</b> Page 2.36	<b>Universal Joint</b> for the support or suspension of positive drive or freely oscillating gyratory sifting machines. 10 sizes up to 40'000 N per AK.	<b>Gyratory sifter upright staying</b>	<b>Gyratory sifter hanging</b>
	<b>AV</b> Page 2.38	<b>Single Joint</b> 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.		

# Selection table for guided systems (crank driven)

				
		One mass shaker "brute-force" system	One mass shaker "natural frequency" system	Two mass shaker "fast-runner" system with reaction force-compensation
	<b>AU</b> Page 2.25	<b>Single Rocker</b> with adjustable length. Models with right-hand and left-hand threads. 7 sizes up to 5'000 N per rocker suspension.		
	<b>AS-P</b> <b>AS-C</b> Page 2.26	<b>Single Rocker</b> with decided center distance. 6 sizes up to 2'500 N for flange fixation. 6 sizes up to 2'500 N for central fixation.		
	<b>AD-P</b> <b>AD-C</b> Page 2.27			<b>Double Rocker</b> with decided center distance. 5 sizes up to 2'500 N for flange fixation. 4 sizes up to 1'600 N for central fixation.
	<b>AR</b> Page 2.28	<b>Single rocker</b> and <b>double rocker</b> with adjustable length, connection of the AR elements using round pipe. Two mass shakers with design feasibility of two-directional conveying. 2 sizes up to 800 N per rocker suspension.		
	<b>ST</b> Page 2.29	<b>Drive Head</b> for crank drive transmission in shaker conveyors. Models with right-hand and left-hand threads. 9 sizes up to 27'000 N per drive head.		
	<b>DO-A</b> Page 2.30	<b>Spring Accumulator</b> with high dynamic spring value for feeder systems running close to resonance frequency. A spring accumulator consists of 2 DO-A elements. 5 sizes up to dynamic spring value of 320 N/mm.		

Notes regarding some special shaker systems:

- For free oscillating systems on pages 2.16–2.19
- For guided systems on pages 2.31 – 2.33
- For gyratory sifters on page 2.34



# Technology of free oscillating systems with unbalanced excitation

## Introduction

Free oscillating systems are either activated in using exciters, unbalanced motors or unbalanced shafts.

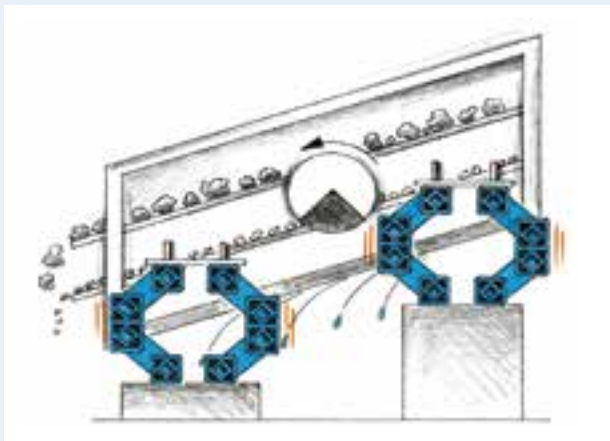
The oscillation amplitude, type of vibration and the direction of vibration of the screen are determined by the dimensioning and arrangement of these actuators. The excitation force, the angle of inclination of the excitation, the inclination of the screen-box and the position of the center of gravity determine the resulting oscillation amplitude of the device. The oscillation amplitude, and thereby the conveying speed of the machine, can be optimized by augmenting these.

ROSTA spring suspensions support the desired oscillation movement of the screen machine. Through their shape and function, they help to achieve a purely linear conveyor motion without unwanted lateral tumbling.

These ideal spring suspensions harmonically support the running of the vibrating screen. Because of their high spring deflection capacity, they offer a good detuning of the excitation frequency with a very low natural frequency, which guarantees a high isolation effect with regard to the machine substructure. The ROSTA mounts effectively dissipate the large residual force peaks at start-up and shut-down, when passing through the natural frequency of the suspension.



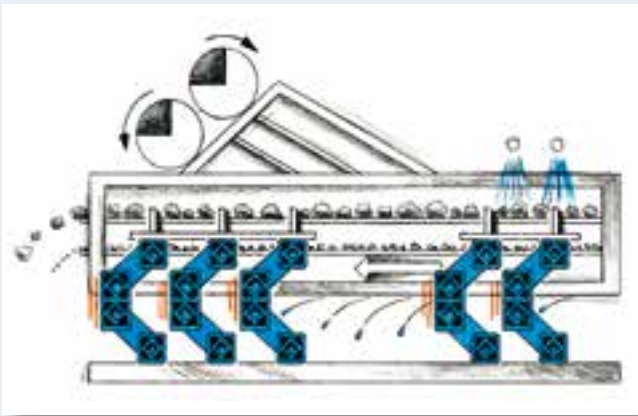
## Circular motion screens



Circular motion screens or circular vibrators are normally excited by unbalanced weights that create a circular rotating oscillation of the screening frame. Relatively low accelerations of the screened material are achieved with this form of excitement. Circular vibrators thereby normally work with a screening frame inclination of  $15^\circ$  to  $30^\circ$ , so that an adequate material throughput is ensured.

It is recommended to mount circular vibratory screens of this kind on ROSTA type AB or AB-HD oscillating mountings. Experience has shown that the positioning of the AB suspensions under circular vibrators should be a mirror-inverted of each other, which, with the above-mentioned frame inclination, will counteract the tendency of the shifting of the center of gravity. If the suspension of the screening frame requires two supporting suspensions per brace support for reasons of capacity, these should also be preferably arranged in mirror-inverted manner for the above-mentioned reason.

## Linear motion screens



Linear motion screens or linear vibrators are normally excited by two unbalanced motors or by means of linear exciters, as well as through double unbalanced shafts (Eliptex), which generate a linear or slightly elliptical oscillation of the screening frame. Depending on the inclination positioning of the exciter, the angle of throw of the screened product can be adapted to the desired form of processing. A very high acceleration of the screened product, i.e. a higher material throughput, is achieved with linear vibrating screens. The screening frame of the linear vibrator is normally in the horizontal position.

Linear vibrating screens are preferably mounted on ROSTA oscillating mountings type AB or AB-HD. Depending on the positioning of the exciter on the screening frame, the feed-end: discharge-end load distribution can be different. The feed-end side is normally lighter, as the exciters are positioned close to the discharge-end and thereby pull the material through the screening frame; in many cases, the feed-end: discharge-end distribution is thereby 40% to 60%. In the interest of an even suspension, it is thereby recommended to mount the screening frame on six or more ROSTA oscillating mountings. All oscillating mountings should stand in the same direction, with the "knee" pointing in the discharge-end direction.

## Linear motion screens with counterframe

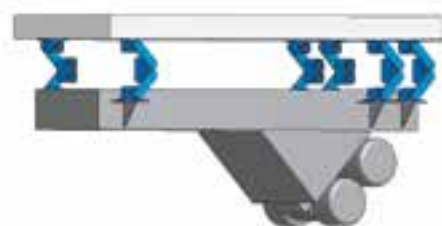


If, due to the demands of the process, large screens are mounted at a very high position in a building or in a purely steel construction, the transmission of the residual forces of a single-mass machine can set the

entire structure into unwanted vibrations. Or if a new and more powerful machine is mounted in an existing building, the residual force transmission could be too high for the older building. The residual force transmission is drastically reduced through the mounting of a counterframe under the screen, with only a negligible loss of oscillation amplitude (compensation movement of the counterframe reduces the oscillation amplitude).

ROSTA also has the ideal supports for the suspension of counterframes, the very compact mountings type AB-D.

## Discharge chutes hanging under silos and bunkers

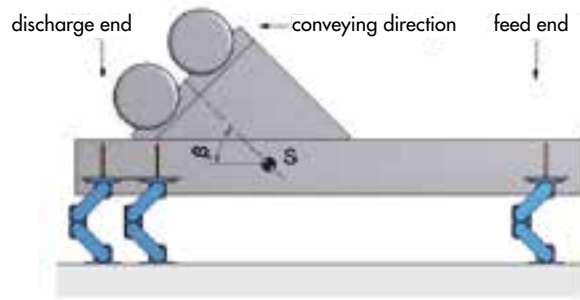


Discharge chutes under silos are normally supported by means of complicated yoke constructions and are suspended on pressure springs. With its HS suspensions (HS = hanging screen), ROSTA offers the possibility of the direct, cost-effective suspension of the discharge unit on silos and bunkers. The geometry of the HS suspensions has been designed to accommodate tensile loads.

# Technology

## Design layout and evaluation

Subject	Symbol	• Example	Unit
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 <sup>2</sup>
Load per corner feed end	$F_{\text{feed end}}$	1263	N
Load per corner discharge end	$F_{\text{discharge end}}$	2563	N
<b>• Element choice in example</b>		<b>6x AB 38</b>	
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	$F_z$	30'319	N
Oscillating machine factor	$K$	4.0	
Machine acceleration	$a = K \cdot g$	4.0	g
<b>• Natural frequency suspensions</b>		<b>fe</b>	<b>2.7 Hz</b>
Degree of isolation	$W$	97	%



### Calculation formulas

#### Loading per corner

$$F_{\text{feed-end}} = \frac{m \cdot g \cdot \% \text{ feed-end}}{2 \cdot 100} \quad F_{\text{discharge-end}} = \frac{m \cdot g \cdot \% \text{ discharge-end}}{2 \cdot 100} \quad [N]$$

#### Oscillating stroke (Amplitude peak to peak)

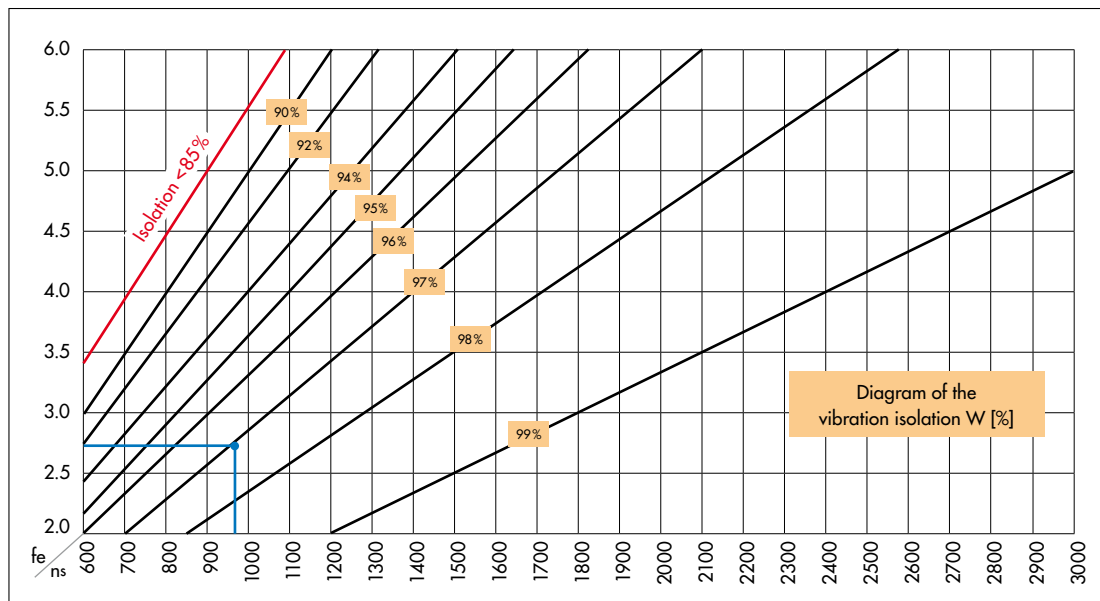
$$sw_0 = \frac{AM}{m_0} \cdot 10 \quad sw = \frac{AM}{m} \cdot 10 \quad [mm]$$

#### Centrifugal force

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

#### Oscillating machine factor

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



### Vibration isolation

$$W = 100 - \frac{100}{\left(\frac{n_s}{60 \cdot fe}\right)^2 - 1} \quad [%]$$

#### • 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:

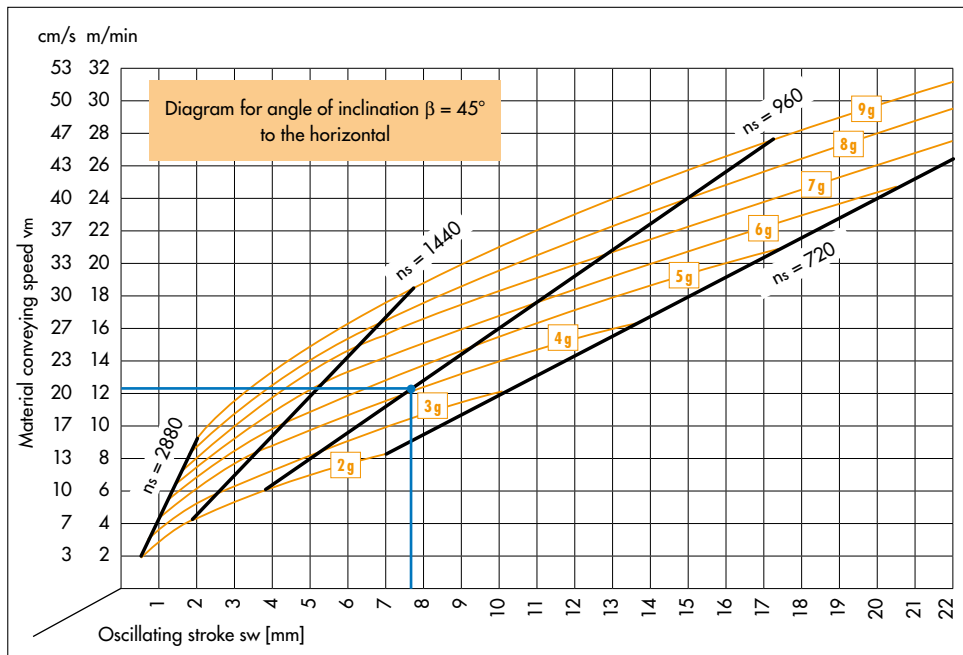
- High coupling or sticking of humid bulk material
- Channel running full
- Fully stacked screen deck with humid material
- Weight distribution with and without conveyed material
- Centrifugal force does not run through the center of gravity (channel full or empty)
- Sudden impact loading occurs
- Subsequent additions to the screen structure (e.g. additional screening deck)





# Technology

## Determination of the average material conveying speed $v_m$



### 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.

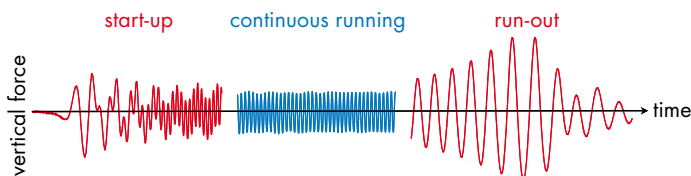
### • Example:

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

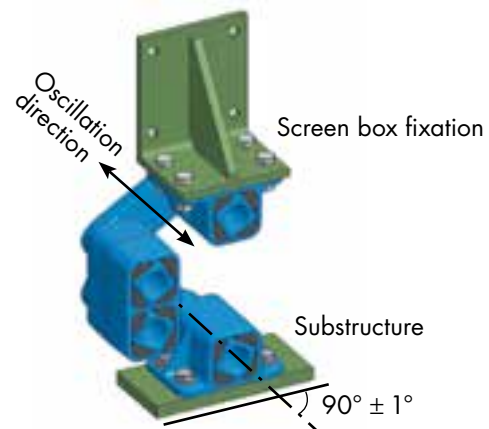
At the screen start-up and run-out the suspension elements are passing through the resonance frequency. By the resulting amplitude superelevation the four rubber suspensions in the AB mountings do generate a high level of damping which is absorbing the remaining energy after only a few strokes. The screen 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 ( $90^\circ$ ) to the conveying axis, with maximum tolerance of  $\pm 1^\circ$ .

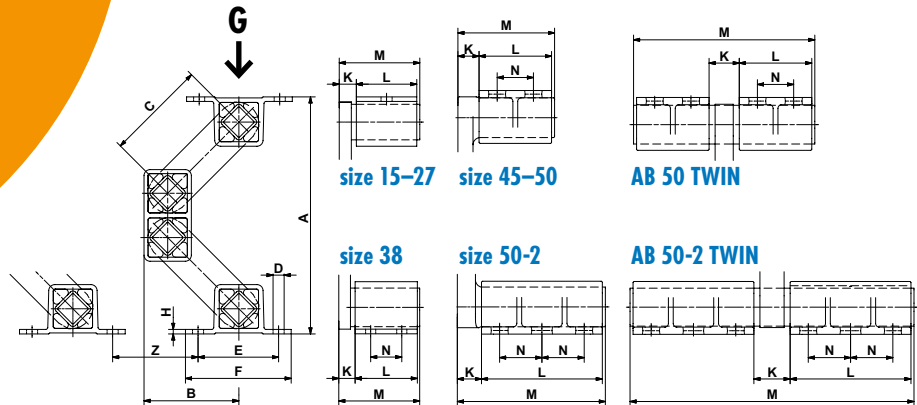




# Oscillating Mountings

Type AB (standard blue)

Type ABI (stainless steel)



Oscillating Mountings

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	168	114	70	88	80	$\frac{\phi 7}{7 \times 10}$	50	65	3	10	40	52	-	0.5
07 171 107	ABI 15	70 – 180														0.9
07 051 057	AB 18	120 – 350	208	146	88	109	100	$\frac{\phi 9}{9 \times 15}$	60	80	3.5	14	50	67	-	1.2
07 171 114	ABI 18															1.7
07 051 058	AB 27	250 – 800	235	170	94	116	100	$\frac{\phi 11}{11 \times 20}$	80	105	4.5	17	60	80	-	2.2
07 171 109	ABI 27															3.3
07 051 059	AB 38	600 – 1'600	305	225	120	147	125	$\frac{\phi 13}{13 \times 20}$	100	125	6	21	80	104	40	5.1
07 171 110	ABI 38															7.6
07 051 054	AB 45	1'200 – 3'000	353	257	141	172	140	13x26	115	145	8	28	100	132	58	11.5
07 171 111	ABI 45				137	168										13.5
07 051 061	AB 50	2'500 – 6'000	380	277	150	184	150	17x27	130	170	12	35	120	160	60	19.1
07 171 112	ABI 50															21.9
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
07 171 113	ABI 50-2															35.4
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

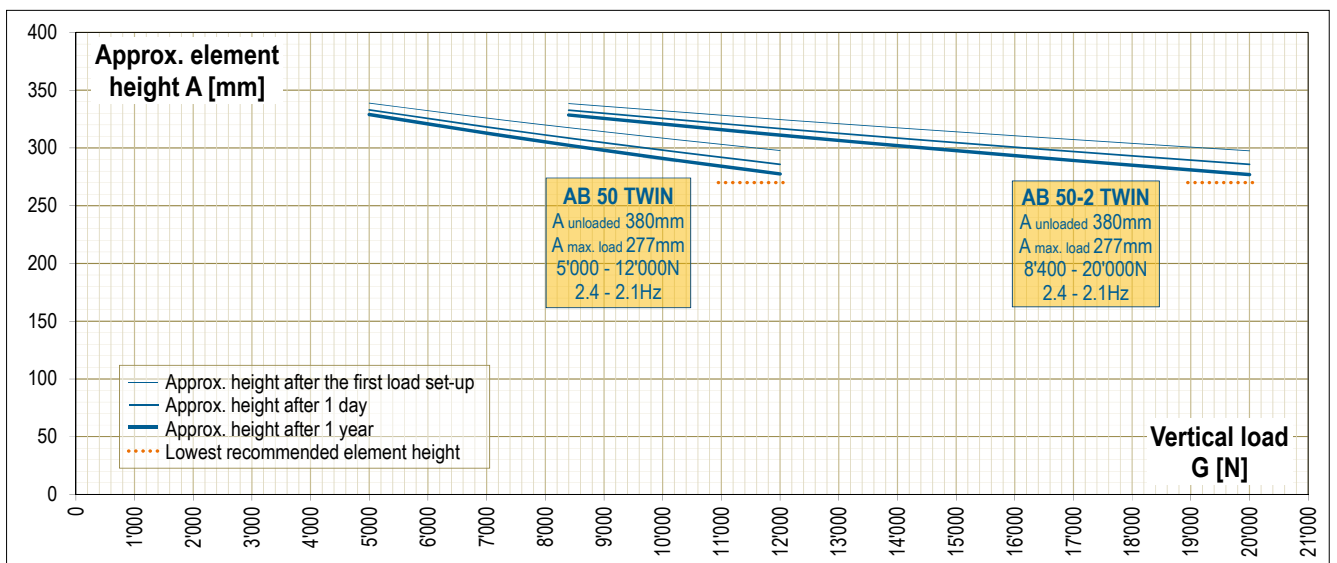
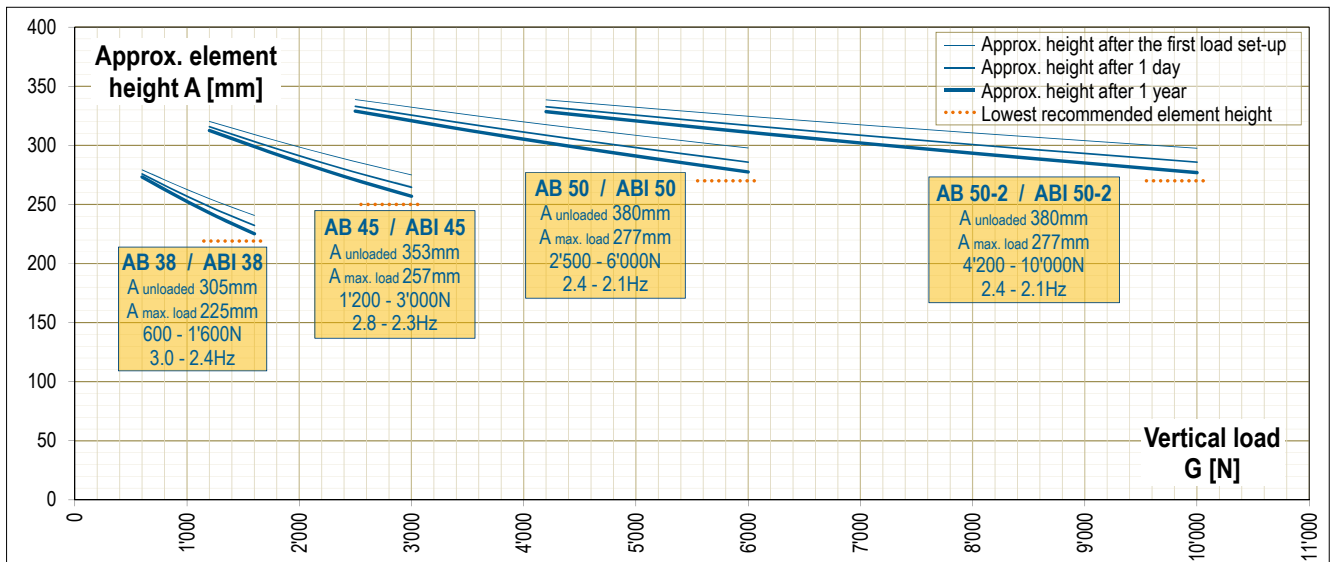
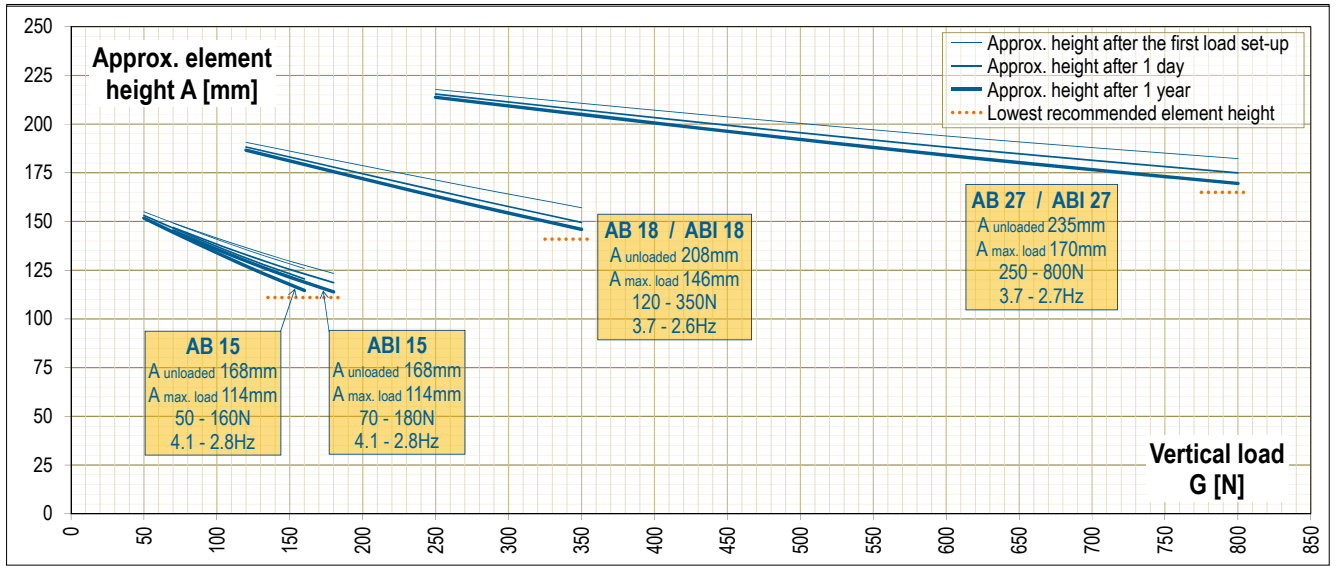
Art. No.	Type	Natural frequency Gmin. – Gmax. [Hz]	Z	Dynamic spring value		Capacity limits by different rpm						Light metal profile	Steel welded construction	Nodular cast iron	ROSTA blue painted	Stainless steel casing
				cd vertical [N/mm]	cd horizontal [N/mm]	720 min <sup>-1</sup> sw max. [mm]	K max. [-]	960 min <sup>-1</sup> sw max. [mm]	K max. [-]	1440 min <sup>-1</sup> sw max. [mm]	K max. [-]					
07 051 056	AB 15	4.0 – 2.8	65	10	6	14	4.1	12	6.2	8	9.3	x	x	x		
07 171 107	ABI 15															x
07 051 057	AB 18	3.7 – 2.6	80	20	14	17	4.9	15	7.7	8	9.3	x	x	x		
07 171 114	ABI 18															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		
07 171 109	ABI 27															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		
07 171 110	ABI 38															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	
07 171 111	ABI 45															x
07 051 061	AB 50	2.4 – 2.1	140	190	85	22	6.4	18	9.3	8	9.3			x	x	
07 171 112	ABI 50															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	
07 171 113	ABI 50-2															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	380	170	22	6.4	18	9.3	8	9.3	x	x	x		

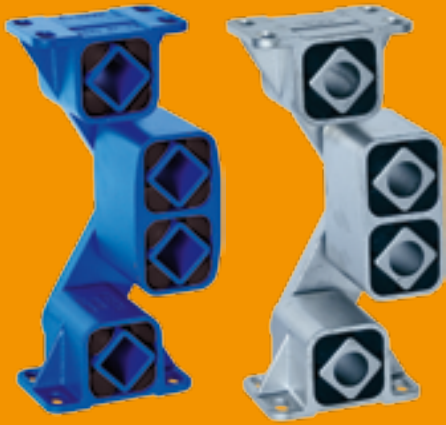
Values in nominal load range at 960 min<sup>-1</sup> and sw of 8 mm  
Acceleration > 9.3 g is not recommended

Material structure

\* compression load Gmax. and cold flow compensation (after approx. 1 year).

# Element heights and cold flow behaviour AB and ABI

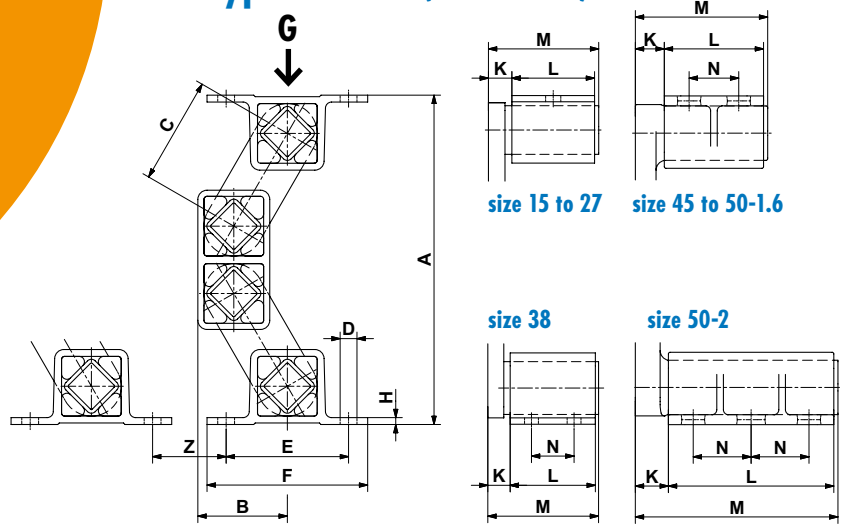




# Oscillating Mountings

Type AB-HD (standard blue)

Type ABI-HD (stainless steel)



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]
07 171 121	ABI-HD 15	150 – 400	132	107	36	50	45	7x10	50	65	3	10	40	52	–	0.8
07 171 128	ABI-HD 18	300 – 700	171	141	47	64	60	9x15	60	80	3.5	14	50	67	–	1.5
07 051 070	AB-HD 27	500 – 1'250	215	182	59	78	70	ø11 11x20	80	105	4.5	17	60	80	–	2.0
07 171 123	ABI-HD 27															3.3
07 051 071	AB-HD 38	1'200 – 2'500	293	246	79	106	95	ø13 13x20	100	125	6	21	80	104	40	4.9
07 171 124	ABI-HD 38															7.3
07 051 072	AB-HD 45	2'000 – 4'200	346	290	98 94	130 126	110	13x26	115	145	8	28	100	132	58	11.3
07 171 125	ABI-HD 45															13.6
07 051 062	AB-HD 50	3'500 – 8'400	376	313	105	141	120	17x27	130	170	12	40	120	165	60	20.4
07 171 126	ABI-HD 50															22.3
07 051 063	AB-HD 50-1.6	4'800 – 11'300	376	313	105	141	120	17x27	130	170	12	40	160	205	70	27.1
07 051 060	AB-HD 50-2															32.4
07 171 127	ABI-HD 50-2	6'000 – 14'000	376	313	105	141	120	17x27	130	170	12	45	200	250	70	35.8

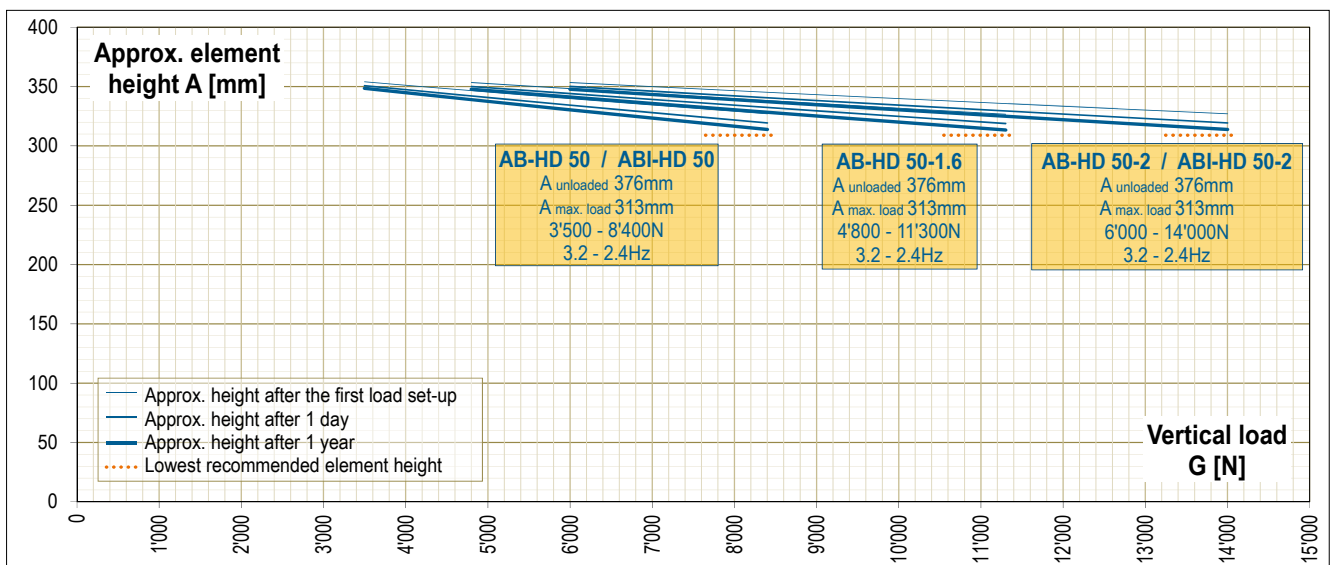
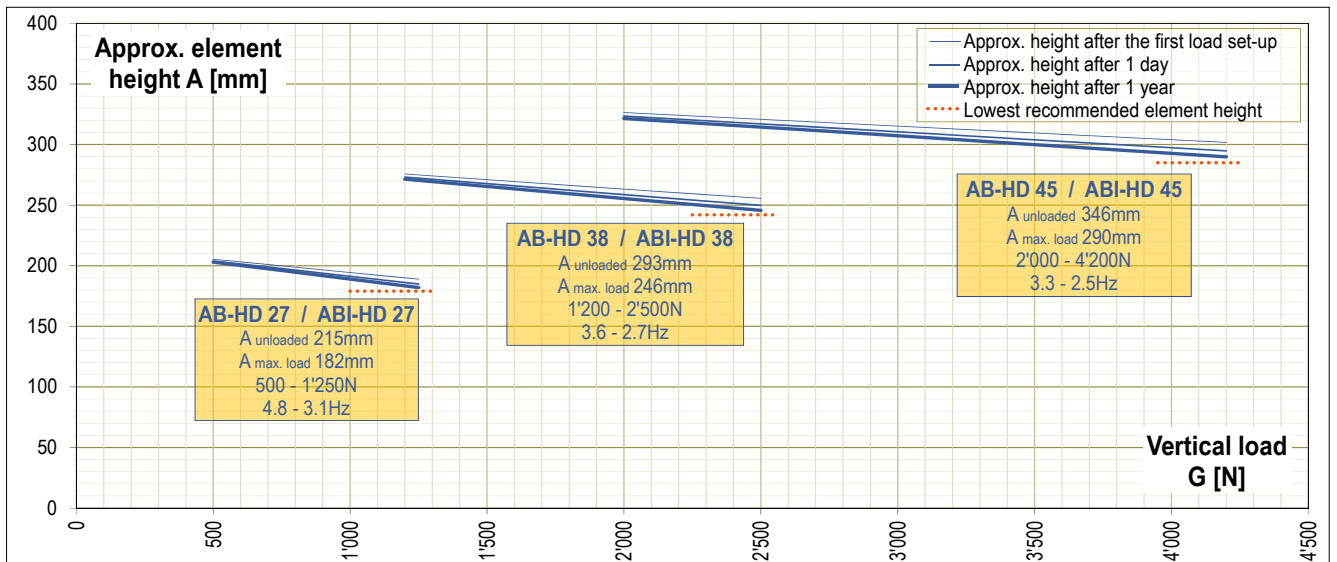
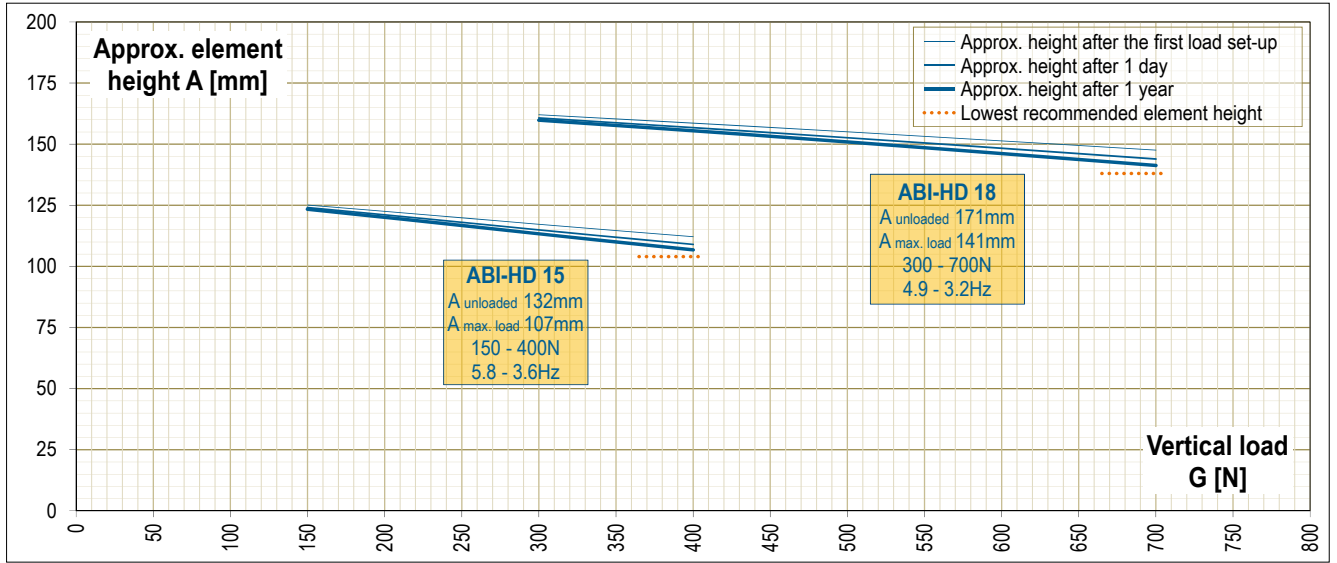
Art. No.	Type	Natural frequency Gmin. – Gmax. [Hz]	Z	Dynamic spring value		Capacity limits by different rpm						Light metal profile	Steel welded construction	Nodular cast iron	ROSTA blue painted	Stainless steel casting
				cd vertical [N/mm]	cd horizontal [N/mm]	720 min <sup>-1</sup> sw max. [mm]	K max. [-]	960 min <sup>-1</sup> sw max. [mm]	K max. [-]	1440 min <sup>-1</sup> sw max. [mm]	K max. [-]					
07 171 121	ABI-HD 15	5.8 – 3.6	35	18	10	8	2.3	7	3.6	5	5.8					x
07 171 128	ABI-HD 18	4.9 – 3.2	50	32	20	10	2.9	9	4.6	7	8.1					x
07 051 070	AB-HD 27	4.8 – 3.1	60	70	33	12	3.5	10	5.2	8	9.3	x	x		x	
07 171 123	ABI-HD 27															
07 051 071	AB-HD 38	3.6 – 2.7	90	100	48	15	4.3	13	6.7	8	9.3	x	x		x	
07 171 124	ABI-HD 38															
07 051 072	AB-HD 45	3.3 – 2.5	100	150	72	17	4.9	14	7.2	8	9.3	x	x	x	x	
07 171 125	ABI-HD 45															
07 051 062	AB-HD 50	3.2 – 2.4	120	270	130	18	5.2	15	7.7	8	9.3			x	x	
07 171 126	ABI-HD 50															
07 051 063	AB-HD 50-1.6	3.2 – 2.4	120	360	172	18	5.2	15	7.7	8	9.3	x	x	x	x	
07 051 060	AB-HD 50-2															
07 171 127	ABI-HD 50-2	3.2 – 2.4	120	450	215	18	5.2	15	7.7	8	9.3			x	x	x

Values in nominal load range at 960 min<sup>-1</sup> and sw of 8 mm

Acceleration > 9.3 g is not recommended

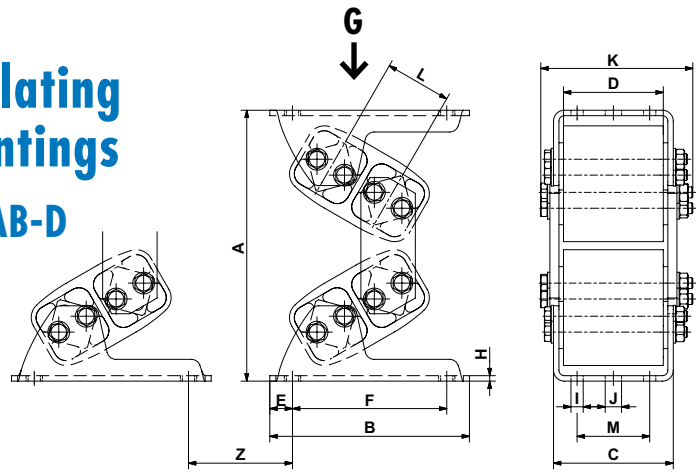
Material structure

# Element heights and cold flow behaviour AB-HD and ABI-HD





# Oscillating Mountings Type AB-D

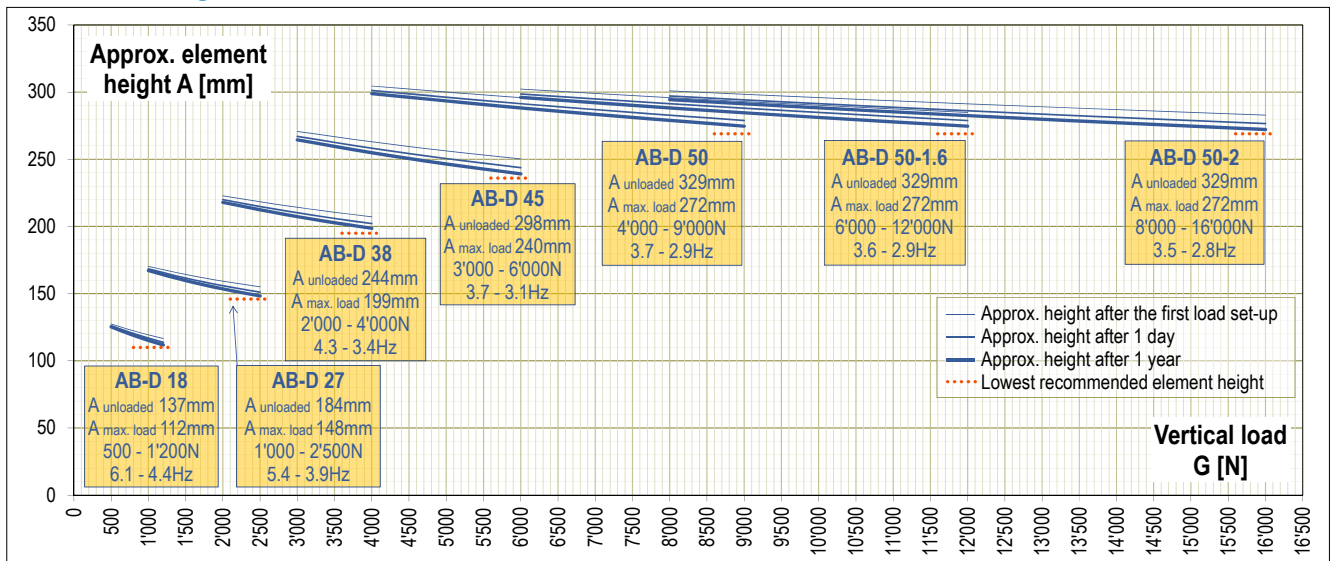


Art. No.	Type	Load capacity Gmin. – Gmax. [N]	A un- loaded	A* max. load	B	C	D	E	F	H	I	J	K	L	M	Weight [kg]
07 281 000	<b>AB-D 18</b>	500 – 1'200	137	112	115	61	50	12.5	90	3	9	9	74	31	30	1.3
07 281 001	<b>AB-D 27</b>	1'000 – 2'500	184	148	150	93	80	15	120	4	9	11	116	44	50	2.9
07 281 002	<b>AB-D 38</b>	2'000 – 4'000	244	199	185	118	100	17.5	150	5	11	13.5	147	60	70	7.5
07 281 003	<b>AB-D 45</b>	3'000 – 6'000	298	240	220	132	110	25	170	6	13.5	18	168	73	80	11.5
07 281 004	<b>AB-D 50</b>	4'000 – 9'000	329	272	235	142	120	25	185	6	13.5	18	166	78	90	22.0
07 281 005	<b>AB-D 50-1.6</b>	6'000 – 12'000	329	272	235	186	160	25	185	8	13.5	18	214	78	90	25.5
07 281 006	<b>AB-D 50-2</b>	8'000 – 16'000	329	272	235	226	200	25	185	8	13.5	18	260	78	90	29.0

Art. No.	Type	Natural frequency Gmin. – Gmax. [Hz]	Z	Dynamic spring value			Capacity limits by different rpm						Light metal profile	Steel plate	Nodular cast iron	ROSTA blue painted
				cd vertical [N/mm]	cd at sw [mm]	cd horizontal [N/mm]	720 min <sup>-1</sup>		960 min <sup>-1</sup>		1440 min <sup>-1</sup>					
							sw max. [mm]	K max. [-]	sw max. [mm]	K max. [-]	sw max. [mm]	K max. [-]				
07 281 000	<b>AB-D 18</b>	6.1–4.4	30	100	4	20	5	1.4	5	2.6	4	4.6	x	x		x
07 281 001	<b>AB-D 27</b>	5.4–3.9	35	160	4	35	7	2.0	6	3.1	5	5.8	x	x		partial
07 281 002	<b>AB-D 38</b>	4.3–3.4	40	185	6	40	9	2.6	8	4.1	6	7.0	x	x		partial
07 281 003	<b>AB-D 45</b>	3.7–3.1	55	230	8	70	11	3.2	9	4.6	7	8.1	x	x		partial
07 281 004	<b>AB-D 50</b>	3.7–2.9	55	310	8	120	12	3.5	10	5.2	8	9.3	x	x	x	x
07 281 005	<b>AB-D 50-1.6</b>	3.6–2.9	55	430	8	160	12	3.5	10	5.2	8	9.3	x	x	x	x
07 281 006	<b>AB-D 50-2</b>	3.5–2.8	55	540	8	198	12	3.5	10	5.2	8	9.3	x	x	x	x

Values in nominal load range at 960 rpm      Acceleration > 9.3 g is not recommended      Material structure (zinc-plated couplings)

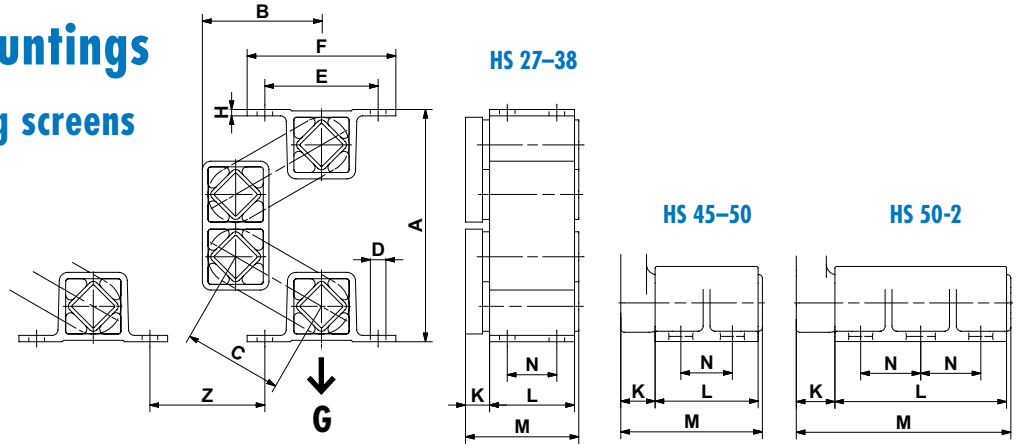
## Element heights and cold flow behaviour AB-D



\* compression load Gmax. and cold flow compensation (after approx. 1 year).

# Oscillating Mountings

## Type HS for hanging screens



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]
07 311 001	HS 27	500 – 1'250	164	202	84	68	70	∅11	80	105	4.5	17	60	80	35	1.6
07 311 002	HS 38	1'200 – 2'500	223	275	114	92	95	∅13	100	125	6	21	80	104	40	4.9
07 311 003	HS 45	2'000 – 4'200	265	325	138	113	110	13x26	115	145	8	28	100	132	58	11.3
07 311 004	HS 50	3'500 – 8'400	288	357	148	118	120	17x27	130	170	12	40	120	165	60	20.2
07 311 005	HS 50-2	6'000 – 14'000	288	357	148	118	120	17x27	130	170	12	45	200	250	70	34.0

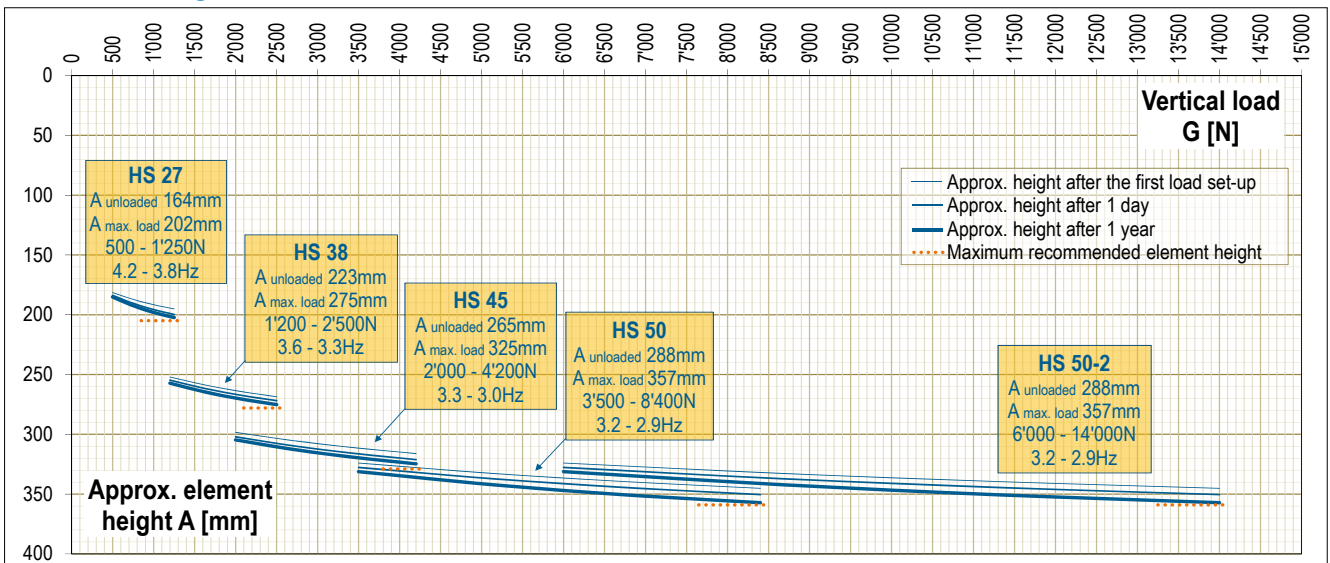
Art. No.	Type	Natural frequency Gmin. – Gmax. [Hz]	Z	Dynamic spring value		Capacity limits by different rpm						Light metal profile	Steel welded construction	Nodular cast iron	ROSTA blue painted
				cd vertical [N/mm]	cd horizontal [N/mm]	720 min <sup>-1</sup>		960 min <sup>-1</sup>		1440 min <sup>-1</sup>					
07 311 001	HS 27	4.2–3.8	70	65	32	12	3.5	10	5.2	8	9.3	x	x		x
07 311 002	HS 38	3.6–3.3	90	95	46	15	4.3	13	6.7	8	9.3	x	x		x
07 311 003	HS 45	3.3–3.0	100	142	70	17	4.9	14	7.2	8	9.3	x	x	x	x
07 311 004	HS 50	3.2–2.9	120	245	120	18	5.2	15	7.7	8	9.3			x	x
07 311 005	HS 50-2	3.2–2.9	120	410	200	18	5.2	15	7.7	8	9.3			x	x

Values in nominal load range at 960 min<sup>-1</sup> and sw of 8 mm

Acceleration > 9.3 g is not recommended

Material structure

## Element heights and cold flow behaviour HS



**CE** for HS 50 according 2006/42/EG (hanging load bearing capacities)

The HS Mountings shall be fastened with the foreseen amount of screws (existing fixation holes or slots) of quality 8.8 with consideration of the prescribed fastening torque.

\* tensile load G<sub>max.</sub> and cold flow compensation (after approx. 1 year).

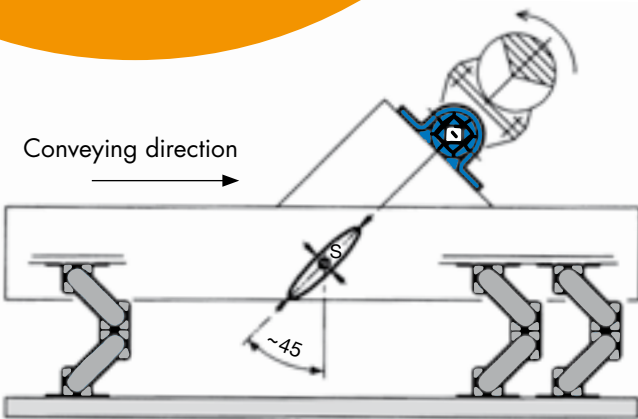
# ROSTA Oscillating Mountings and Accessories for individual Customer Solutions

## Pendulum joint, the cost-efficient drive solution with only one unbalanced motor

If a single vibration motor is built onto an elastic pendulum joint (e.g. a DK element), the device will carry out a slightly elliptical oscillation shape (linear movement). The final oscillation motion is dependent on the distance between pendulum axis and motor axis. The pendulum suspension has only been used on rather smaller feeding devices. The inclination angle of the motor configuration is approx. 45°.



ROSTA components for pendulum mounts are mentioned in the general catalogue "Rubber suspension units".



### Allocation table

Art. No. DK	Type	Centrifugal force max.	Number of brackets	Type	Art. No. BK
01 071 008	<b>DK-A 27 x 60</b>	1'000 N	1	<b>BK 27</b>	01 520 004
01 071 011	<b>DK-A 38 x 80</b>	2'000 N	2	<b>BK 38</b>	01 520 005
01 071 014	<b>DK-A 45 x 100</b>	3'500 N	2	<b>BK 45</b>	01 520 006
01 071 015	<b>DK-A 45 x 150</b>	5'250 N	3	<b>BK 45</b>	01 520 006
01 071 017	<b>DK-A 50 x 200</b>	10'000 N	3	<b>BK 50</b>	01 520 007
01 071 018	<b>DK-A 50 x 300</b>	15'000 N	4	<b>BK 50</b>	01 520 007

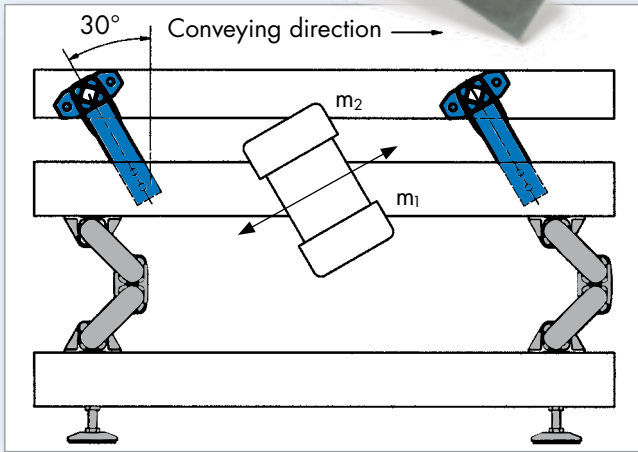
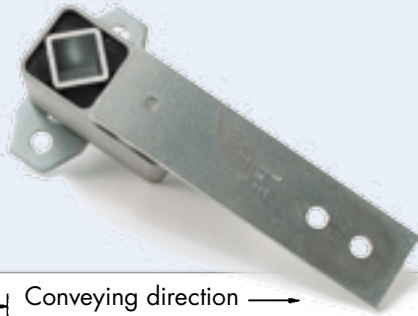
## Suspensions of spiral or coil feeders

Spiral-shaped conveyors are used in processing systems where bulk goods should stay on the conveying trough in the smallest possible space for a long period in order to cool down or dry. Not infrequently, the resulting channel length can be 25–30 meters in a spiral tower that is only five meters high! With a spiral conveyor supported on ROSTA Oscillating Mountings Type AB-D, there is no need for additional fall-prevention devices such as cable bracings or securing pipes in the spiral, as is the case for helical spring supports. If a spring breaks here, the complete spiral tower tilts – unless it has been secured with cable bracings. ROSTA AB-D suspensions offer a high isolation effect, clearly defined oscillations up to the topmost spiral and absolute stability for the spiral tower.





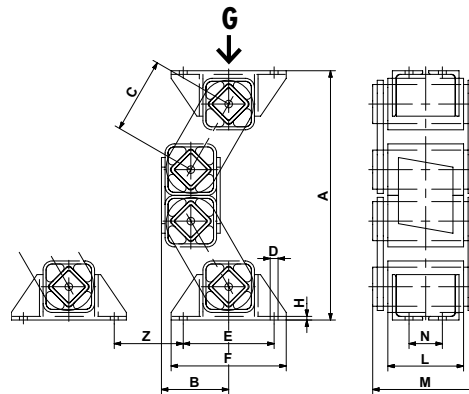
## AU-DO



The AU-DO rocker suspensions have been mainly developed for the channel support in continuously loaded, base frame excited two-mass oscillation systems with unbalanced drive (energetic amplification). The base frame  $m_1$  is excited by means of unbalanced motors and the spring accumulators of the AU-DO rocker suspensions amplify the marginal frame oscillation amplitude into a considerable throw amplitude on the conveying channel  $m_2$ . The base frame is ideally supported on ROSTA Oscillating Mountings Type AB. These systems are characterised by low, hardly measurable residual force transmission into the substructure and are therefore suitable for installation on steel frameworks and intermediate floors in processing buildings. Additional customer benefits are the low-noise operation, the low involved motor power and the simple installation.

The AU-DO elements are available in 5 sizes. We will be glad to calculate your specific system, please ask for our relevant questionnaire.

## Customized Oscillating Mountings Type AB-HD with low natural frequency and high load capacity



Art.-No.	Type	Load capacity Gmin. – Gmax. [N]	A un- loaded	A* max. load	B un- loaded	B* max. load	C	øD	E	F	H	L	M	N	Weight [kg]
07 051 076	<b>AB-HD 70-3</b>	9'000 – 20'000	592	494	160	215	180	22	200	260	9	300	380	200	82
07 051 080	<b>AB-HD 100-2.5**</b>	15'000 – 37'000	823	676	222	302	250	26	300	380	12	250	350	110	170
07 051 081	<b>AB-HD 100-4**</b>	25'000 – 60'000	823	676	222	302	250	26	300	380	12	400	500	260	230

Art.-No.	Type	Natural frequency Gmin. – Gmax. [Hz]	Z	Dynamic spring value		Capacity limits by different rpm						Steel welded construction	ROSTA blue painted
				cd vertical [N/mm]	cd horizontal [N/mm]	720 min <sup>-1</sup>		960 min <sup>-1</sup>		1440 min <sup>-1</sup>			
						sw max. [mm]	K max. [-]	sw max. [mm]	K max. [-]	sw max. [mm]	K max. [-]		
07 051 076	<b>AB-HD 70-3</b>	2.4 – 2.1	200	670	320	25	7.3	18	9.3	8	9.3	x	x
07 051 080	<b>AB-HD 100-2.5**</b>	2.4 – 1.8	250	1150	530	30	8.6	18	9.3	8	9.3	x	x
07 051 081	<b>AB-HD 100-4**</b>	2.4 – 1.8	250	1840	850	30	8.6	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	

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

\* compression load Gmax. and cold flow compensation (after approx. 1 year).

\*\* We will be glad to calculate your specific system, please ask for our relevant questionnaire.



Washing- and dewatering-screen for vegetables on AB Mountings



Vegetable-feeder on stainless steel ABI Mountings



Selection-screen for potato chips on stainless steel AB Mountings



Washing- and dewatering-screen for vegetables on AB Mountings



Circular motion screen for minerals on AB TWIN Mountings



Circular motion screen for gravel on AB TWIN Mountings



Circular motion screen in mobile crushing plant on AB Mountings



Fluid-bed cooler on AB-D Mountings



Pre-selection screen for gemstone on AB Mountings



Cement screening and feeding device on AB Mountings



Wheat-cleaning plant on AB Mountings



Pasta-feeding channel hanging on HS Mountings

# Technology of crank shaft driven shaker conveyors

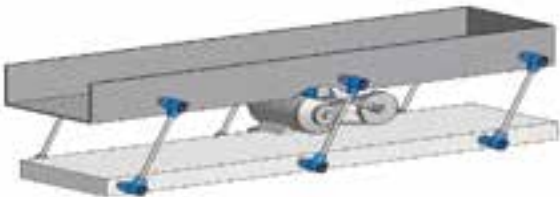
## Introduction

Oscillating shaker conveyors with crank shaft drive are widely used for the transportation and selection of bulk material. A shaker conveyor consists of a heavy and (infinitely) stiff designed shaker and/or screening trough, which is supported by several pairs of guiding rocker arms. The rocker arms are also connected with the lower base frame which is anchored in the building foundation by means of tie bolts. The eccentric shaft transmitting the oscillations to the trough is always driven by elastic belt drive to compensate the hits by the dead centers of the crank shaft drive. A driving rod with an elastic drive head connects the crank drive with the base frame of the trough and transmits the required oscillations for the transport of the bulk material on the feeder. According to the length, stiffness and weight of the shaker trough several pairs of supporting and guiding rocker arms are required between base frame and conveyor.

Relatively **slow** acting oscillating conveyors are usually designed as positive movement systems ("brute-force" systems) transmitting the high reaction forces of the crank reverse motion into the building foundation. Faster running shaker conveyors with crank shaft drive are therefore usually designed as two mass systems with direct compensation of the reaction forces by the counter-mass hanging at the lower end of so said double rocker arms directly underneath the trough mass ("fast-runner" systems).

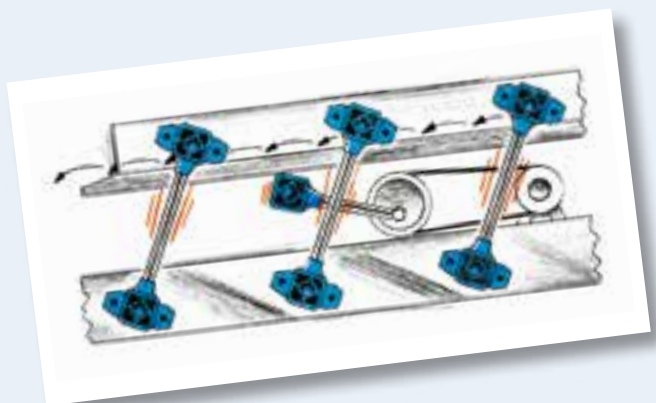
To achieve a very "smooth" course of motions on **fast** acting shaker conveyors based on one or two masses the installation of additional **spring accumulators** offering an actuation of the shaker system close by the resonance frequency ("natural frequency" systems) is recommended. These pre-loaded spring accumulators compensate the hard hits of the crank shaft drive at the dead centers and are heavily supporting the eccentric trough motion with their high dynamic stiffness.

## One mass shaker conveyor systems without spring accumulators

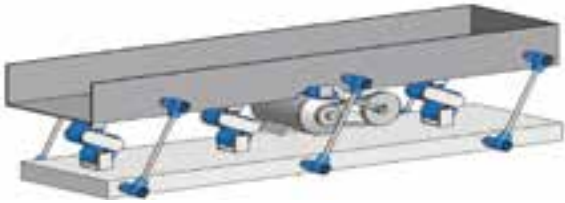
Design	Characteristics	ROSTA elements
 <p>"brute-force" system as basic version</p>	<p>acceleration: <b>1.1 to 1.7 g-forces</b></p> <p>conveying speed: <b>6 to 15 m/min</b></p> <p>trough lengths: <b>max. 12 to 15 meters</b></p>	<p>oscillating mountings: <b>AU, AS-P, AS-C, AR</b></p> <p>drive heads: <b>ST</b></p>

The "brute-force" shaker conveyor system is widely used in the processing industries due to its constructive simplicity and cost efficient design method. It characterizes by a massive feeding trough mounted on several pairs of guiding rocker arms connected with a ground frame and driven by a crank shaft system. The relatively low costs for the design and construction of this feeding system are favouring this standard shaker for the use in many processing operations where rather low material speeds are fully adequate. Too high speeds and too long strokes would generate in this one mass system too high shocks by the change in direction of the crank shaft drive. Therefore, accelerations of >1,7 g-forces are not applicable with this "brute-force" shaker.

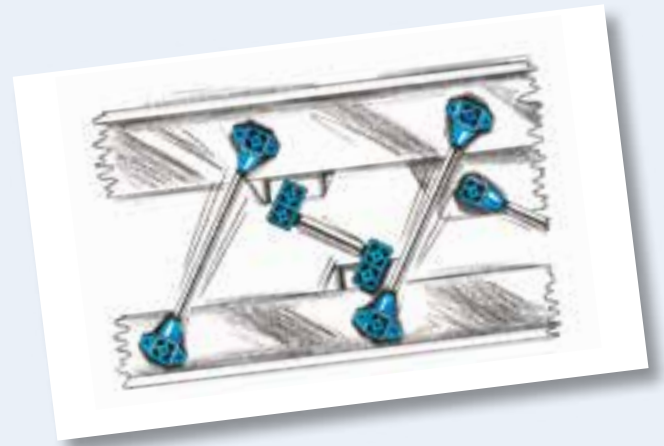
To avoid high material fatigue stress on the trough structure, the relevant design should feature heavy stiffening ribs and border strips to make the feeding channel more or less "infinitely" stiff. One mass shaker conveyors have to be bolted down on the foundations by means of tie anchors.




## One mass shaker conveyor systems equipped with spring accumulators

Design	Characteristics	ROSTA elements
 <p>"natural frequency" system offering smooth course</p>	<p>acceleration: <b>1.1 to 2.2 g-forces</b></p> <p>conveying speed: <b>6 to 22 m/min</b></p> <p>trough lengths: <b>up to 20 meters</b></p>	<p>oscillating mountings: <b>AU, AS-P, AS-C, AR</b></p> <p>drive heads: <b>ST</b></p> <p>spring accumulators: <b>DO-A elements</b></p>

These "natural frequency" feeding system generally shows the same constructive design like the "brute-force" shaker, but is disposed with additional spring accumulator sets installed between trough structure and ground frame in order to reduce the hard hits by the change in direction of the crank shaft drive. Furthermore, due to the high dynamic stiffness of the spring accumulator sets, the course of motions of the trough becomes harmonic, energy-saving and gentle avoiding material stress and early fatigue cracks on the structure. This system runs very silent due to the permanent, bidirectional spring action support at the stroke ends. The max. acceleration of this one mass system should not exceed 2.2 g-forces. The quantity and size of the required spring accumulators depends on the trough weight and the relevant rpm's of the crank shaft drive.



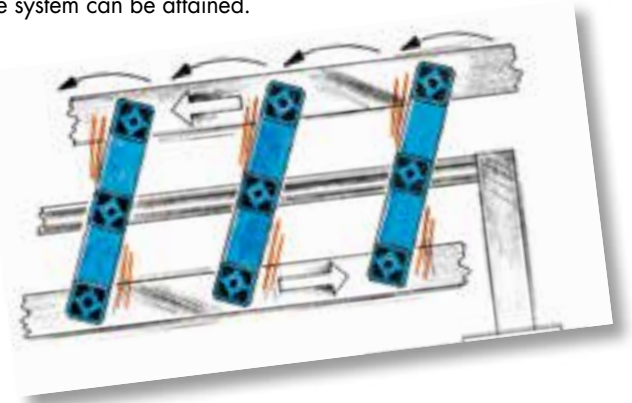
## Two mass shaker conveyor systems with direct reaction force-compensation

Design	Characteristics	ROSTA elements
 <p>"fast-runner" system offering high capacities</p>	<p>acceleration: <b>1.5 to 5.0 g-forces</b></p> <p>conveying speed: <b>10 to 45 m/min</b></p> <p>trough lengths: <b>up to 25 meters</b></p>	<p>oscillating mountings: <b>AD-P, AD-C, AR</b></p> <p>drive heads: <b>ST</b></p> <p>spring accumulators: <b>additional DO-A elements</b></p>

This system is the "fast-runner" among the crank shaft driven shaker conveyors offering a very high material throughput. The lower counter-mass frame, directly connected with the feeding trough by means of ROSTA double rocker arms, fully compensates the resulting inertia forces of the mass 1 (trough) provided that its overall weight is identical with the trough weight. The upper shaker trough and also the counter-mass frame (or trough) offer a **procedural** field of applications. Both are feeding bulk material in the same direction; e.g. adding a sieve fraction in the upper trough bottom the small particles are sorted out and drop on the lower counter-mass or counter-trough being also shaken to the discharge-end of the machine.

For the most part, these two mass high-speed shaker conveyors are designed as smooth running "natural frequency" systems. Adding a quantitatively sufficient number of double rocker arms between trough, machine frame and counter-mass, the resulting

high dynamic stiffness of the elastic suspensions keeps the shaker machine running close to the natural frequency of the rocker arms. Otherwise, also by installing some additional DO-A spring accumulators between machine frame and trough or between machine frame and counter-mass a natural frequency acting of the system can be attained.



# Technology

## 1. One mass systems without spring accumulators: Calculation



	Subject	Symbol	Example	Unit
Length, weight	Trough length	L	2.5	m
	Weight empty trough	m <sub>0</sub>	200	kg
	Weight of feeding material		50	kg
	Material coupling factor 50% *	m <sub>m</sub>	25	kg
	Weight of oscillating mass *	m = m <sub>0</sub> + m <sub>m</sub>	225	kg
Drive parameter	Eccentric radius	R	12	mm
	Stroke	sw = 2 · R	24	mm
	Rpm on trough	n <sub>s</sub>	340	min <sup>-1</sup>
	Gravity acceleration	g	9.81	m/s <sup>2</sup>
	Oscillating machine factor	K	1.6	
	Acceleration	a = K · g	1.6	g
	Total spring value of system	c <sub>t</sub>	285	N/mm
Rocker arms	Distance between rockers max.	L <sub>max</sub>	1.5	m
	Quantity of rockers	z	6	
	Load per rocker	G	368	N
	<b>Selection osc. elements (e. g.)</b>		<b>12x AU 27</b>	
	<b>Selection ROSTA-elements: AU, AR, AS-P, AS-C</b>			
Drive	Center distance of elements	A	200	mm
	Acceleration force	F	3423	N
	<b>Selection drive head</b>		<b>1x ST 45</b>	
Spring value of natural frequency shaker	Drive capacity approx.	P	1.0	kW
	Dynamic torque	M <sub>d</sub>	2.6	Nm/°
	Dynamic spring value per rocker	c <sub>d</sub>	7.4	N/mm
	Dynamic spring value of all rockers	z · c <sub>d</sub>	44.7	N/mm
	Resonant ability factor	i	0.16	

### Calculation formulas

#### Oscillating machine factor

$$K = \frac{\left(\frac{2\pi}{60} \cdot n_s\right)^2 \cdot R}{g \cdot 1000} = \frac{n_s^2 \cdot R}{894'500} [-]$$

#### Total spring value of system

$$c_t = m \cdot \left(\frac{2\pi}{60} \cdot n_s\right)^2 \cdot 0.001 [N/mm]$$

#### Minimum quantity of rockers

$$z = \left(\frac{L}{L_{max}} + 1\right) \cdot 2 [-]$$

#### Load per rocker

$$G = \frac{m \cdot g}{z} [N]$$

#### Acceleration force (ST selection)

$$F = m \cdot R \cdot \left(\frac{2\pi}{60} \cdot n_s\right)^2 \cdot 0.001 = c_t \cdot R [N]$$

#### Drive capacity approx.

$$P = \frac{F \cdot R \cdot n_s}{9550 \cdot 1000 \cdot \sqrt{2}} [kW]$$

#### Dynamic spring value per rocker

$$c_d = \frac{M_{d, 360} \cdot 1000}{A^2 \cdot \pi} [N/mm]$$

#### Resonant ability factor

$$i = \frac{z \cdot c_d}{c_t} [-]$$

By a resonant ability factor  $i \geq 0,8$  the system is usually titled "natural frequency shaker".

- \* the following factors have to be considered by the definition of the material coupling:
- high coupling factor or sticking of wet and humid material
  - possible stemming of the trough

## 2. One mass system with spring accumulators: Calculation

Calculation analog chapter 1 with following additions:

Spring accumulators	Quantity	z <sub>s</sub>	2	
	Dynamic spring value per item	c <sub>s</sub>	100	N/mm
	Dynamic spring value of all items	z <sub>s</sub> · c <sub>s</sub>	200	N/mm
	Resonant ability factor	i <sub>s</sub>	0.86	
	<b>Selection of accumulators</b>		<b>2x cons. of 2x DO-A 45 x 80</b>	



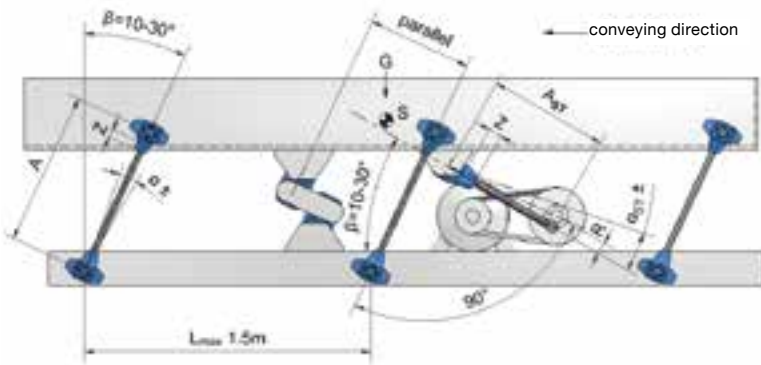
#### Resonant ability factor with accumulators

$$i_s = \frac{z \cdot c_d + z_s \cdot c_s}{c_t} [-]$$

By a resonant ability factor  $i_s \geq 0.8$  the system is usually titled "natural frequency shaker".

# Technology

## 3. One mass shaker conveyor systems: Installation instructions



### Distance between rockers $L_{max}$ :

- Usually, the distance between the rocker arms on the trough along-side is up to 1.5 meters, depending on the stiffness of the trough.
- By trough widths >1.5 m we do recommend to provide the trough bottom side with a third, central row of rocker arms for stability reasons.

### Mounting position drive head ST:

For one mass shaker systems it is recommendable to position the drive head slightly ahead of the center of gravity of the trough, towards the discharge end.

### Rocker mounting angle $\beta$ :

According to the relevant processing function of the shaker conveyor, the rocker arms are positioned at mounting angles between  $10^\circ$  to  $30^\circ$  in relation to the perpendicular line. (The ideal combination of fast conveying speed with high material throw is given by a rocker inclination angle of  $30^\circ$ .) The power input position of the drive-rod from the eccentric drive should stay at right angles to the rocker arms, this orthogonal positioning offers a harmonic course of the drive system.

### Angle of oscillation $\alpha$ :

The machine parameters, angle of oscillation and revolutions should be determined in the admissible area of operations (see chapter 5).

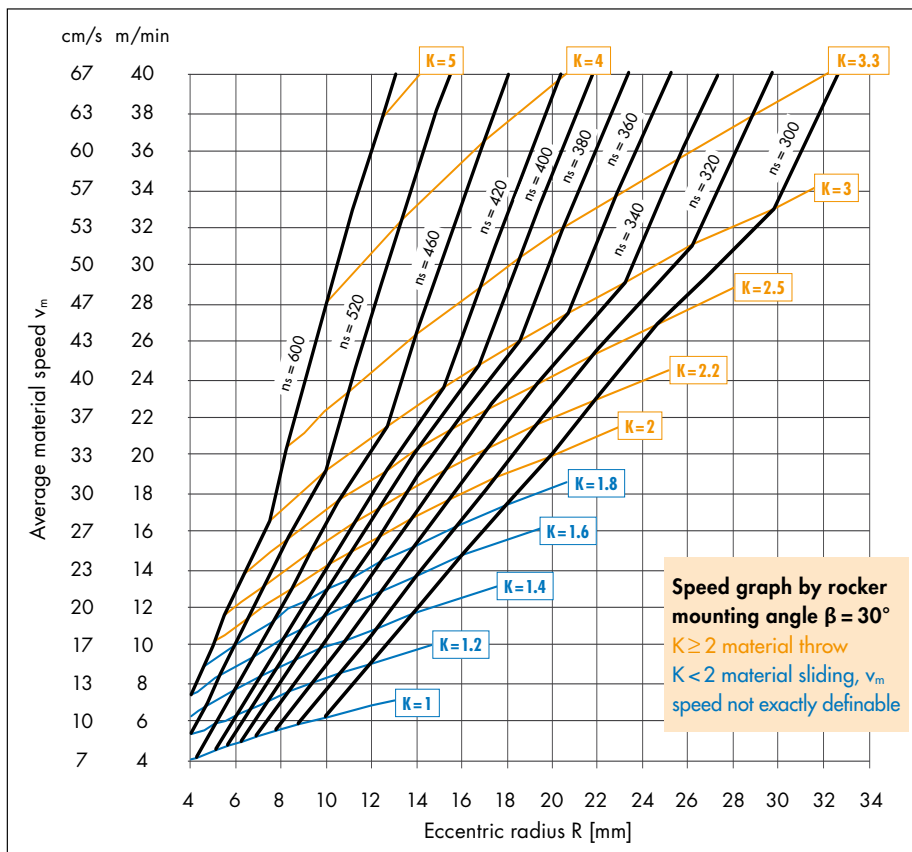
### Screw quality:

The screw quality should be grade 8.8 secured by the required tightening moment.

### Depth of thread engagement $Z$ :

The depth of engagement should be at least  $1.5 \times$  the thread nominal width.

## 4. Average material speed on shakers $v_m$



### Main influence factors

- layer height of material
- property trough bottom (slip-resistance)
- mounting angle  $\beta$  of the rockers
- feeding capability of the material depending on size, form and humidity of the grains, e.g. very dry and fine grained material is submitted to slippage factors up to 30%.

### Example: One mass system with eccentric drive

Out of the intersection point  $R = 12 \text{ mm}$  and the revolutions  $n_s = 340 \text{ min}^{-1}$  is resulting a theoretical material speed of  $v_m = 12 \text{ m/min}$  or  $20 \text{ cm/sec}$ .

By acceleration factors  $K > 2$  and rocker mounting angles of  $\beta = 30^\circ$  (to the perpendicular line) the vertical acceleration is getting bigger than  $1g$ , therefore the material starts lifting from the trough bottom = material throw.

# Technology

## 5. Maximum rocker load $G$ , revolutions $n_s$ and angle of oscillation $\alpha$

Size (e.g. AU 15)	max. load capacity per rocker [N]				max. revolutions $n_s$ [min <sup>-1</sup> ]*	
	K < 2	K = 2	K = 3	K = 4	$\alpha \pm 5^\circ$	$\alpha \pm 6^\circ$
15	100	75	60	50	640	480
18	200	150	120	100	600	450
27	400	300	240	200	560	420
38	800	600	500	400	530	390
45	1'600	1'200	1'000	800	500	360
50	2'500	1'800	1'500	1'200	470	340
60	5'000	3'600	3'000	2'400	440	320

The angle of oscillation  $\alpha$  of each oscillating component (rockers accumulators and drive head) has to be settled within the permissible range ( $n_s$  and  $\alpha$ ).

### Calculation oscillation angle for rockers

Eccentric radius R [mm]  
Center distance A [mm]  
Oscillation angle  $\alpha \pm [^\circ]$

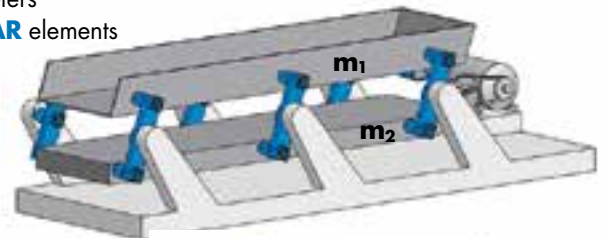
$$\alpha = \arctan\left(\frac{R}{A}\right) [^\circ]$$

Please contact ROSTA for the permissible load indications by higher accelerations and for rocker elements offering higher load capacities. Usually are the revolutions  $n_s$  between 300 to 600 min<sup>-1</sup> and the oscillation angles max.  $\pm 6^\circ$ .

\* basics: "permissible frequencies" in the Technology part of the ROSTA catalogue.

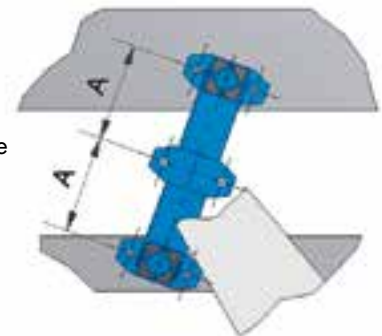
## 6. Two mass shaker systems with direct reaction force-compensation

- Maximum acceleration forces of approx. 5 g, shaker lengths up to 25 meters
- Equipped with ROSTA double rockers **AD-P**, **AD-C** and/or made out of **AR** elements
- Ideal compensation when  $m_1 = m_2$
- Element selection analogue chapter 1, but with load of the two masses:  
Actuated mass (+ material coupling of feeding mass)  $m_1$  [kg]  
Driven mass (+ material coupling of feeding mass)  $m_2$  [kg]  
Total oscillating mass  $m = m_1 + m_2$  [kg]



Dynamic spring value  $c_d$  per double rocker  $c_d = \frac{3 \cdot M_d \cdot 360 \cdot 1000}{2 \cdot A^2 \cdot \pi}$  [N/mm]

- Calculation of  $c_i$  and  $F$  based on the total mass ( $m_1$  and  $m_2$ )
- Power input from eccentric drive with **ST arbitrary** on  $m_1$  or  $m_2$  at **any point** alongside  $m_1$  or  $m_2$
- On demand, special double rocker arms with varying center distances A are available as "customized rockers"



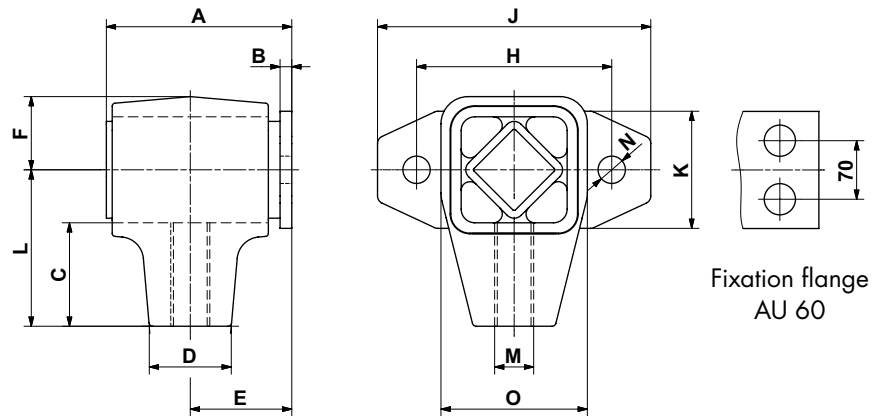
### The 9 installation steps for a two mass system with double rocker arms:

1. All fixation holes for the rockers in trough, counter-mass and machine frame have to be drilled very accurately previous the final machine assembling.
2. Installation of the middle elements of the rocker arms on the central machine frame, all inclination angles duly adjusted (e.g. 30°), tightening of the screws with required fastening torque.
3. Lifting of the counter-mass with accurate horizontal alignment until the bores in the counter-mass frame stay congruent with the bore holes of the lower element. Jamming of the counter-mass with e.g. wooden chocks.
4. Tightening of the fixation screws on counter-mass with required fastening torque.
5. Inserting of the feeding trough into machine frame structure. Accurate horizontal alignment until the bores in the trough stay congruent with the bore holes of the upper element. Jamming of the trough with e.g. wooden chocks.
6. Tightening of the fixation screws on trough with required fastening torque.
7. Installation of the driving rod with drive head ST in "neutral" position i.e. eccentric drive should stay in between the two stroke ends. Length adjustment of the driving rod and tightening of the counternuts.
8. Removal of the jamming chocks under counter-mass and trough.
9. Test start of the shaker conveyor.



# Oscillating Mountings

## Type AU



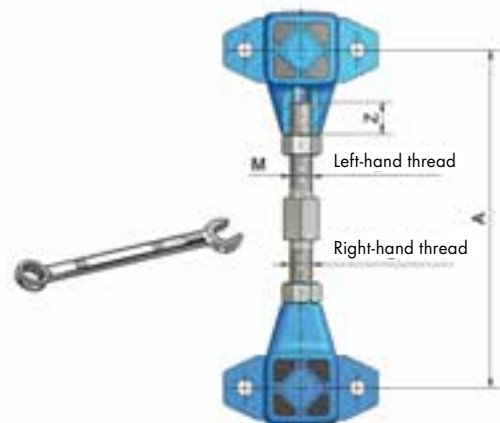
Art. No.	Type	G [N] K<2	Mdd [Nm/°]	A	B	C	□D	E	F	H	J	K	L	M	αN	O	Weight [kg]	Material structure
07 011 001	<b>AU 15</b>	100	0.44	50	4	29	20	28	17	50	70	25	40	M10	7	33	0.2	Light metal casing Steel welded construction, ROSTA blue painted
07 021 001	<b>AU 15L</b>													M10-LH				
07 011 002	<b>AU 18</b>	200	1.32	62	5	31.5	22	34	20	60	85	35	45	M12	9.5	39	0.4	
07 021 002	<b>AU 18L</b>													M12-LH				
07 011 003	<b>AU 27</b>	400	2.6	73	5	40.5	28	40	27	80	110	45	60	M16	11.5	54	0.7	
07 021 003	<b>AU 27L</b>													M16-LH				
07 011 004	<b>AU 38</b>	800	6.7	95	6	53	42	52	37	100	140	60	80	M20	14	74	1.6	
07 021 004	<b>AU 38L</b>													M20-LH				
07 011 005	<b>AU 45</b>	1'600	11.6	120	8	67	48	66	44	130	180	70	100	M24	18	89	2.6	
07 021 005	<b>AU 45L</b>													M24-LH				
07 011 006	<b>AU 50</b>	2'500	20.4	145	10	69.5	60	80	47	140	190	80	105	M36	18	93	6.7	
07 021 006	<b>AU 50L</b>													M36-LH				
07 011 007	<b>AU 60</b>	5'000	38.2	233	15	85	80	128	59	180	230	120	130	M42	18	116	15.7	
07 021 007	<b>AU 60L</b>													M42-LH				

G = max. load in N per element or rocker, by higher accelerations K, consult chapter 5 on page 2.24.  
Mdd = dynamic element torque in Nm/° by oscillation angles  $\alpha \pm 5^\circ$  in speed range of  $n_s = 300 - 600 \text{ min}^{-1}$ .

## Connection rod

All connection rods have to be provided by the customer. It is recommendable to use rods with right-hand and left-hand threaded fixation stubs and also ROSTA AU elements with right-hand and left-hand threads. In this combination the rocker length or center distance can be adjusted infinitely. In using only right-hand threaded rods, the final length adjustment of the rockers is less accurate – especially by the fine tuning of the shaker course it requires an exact length adjustment of all rocker arms to avoid lateral sliding of the trough.

The center distance A has to be identical by all attached rocker arms. The depth of thread engagement Z has to be at least **1.5x M**.

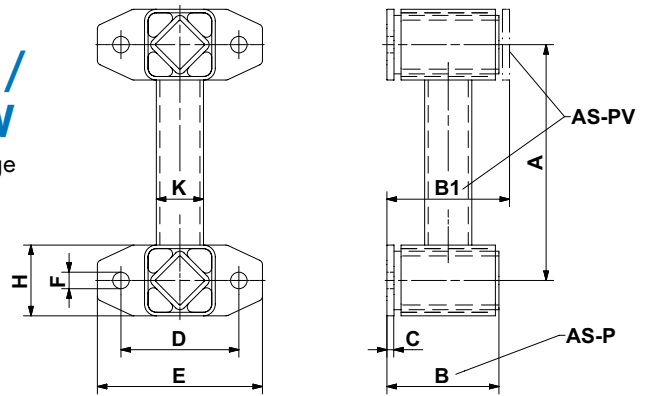


Further basic information and calculations on pages 2.22–2.24.



## Single Rockers

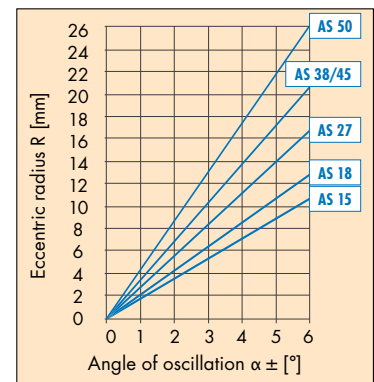
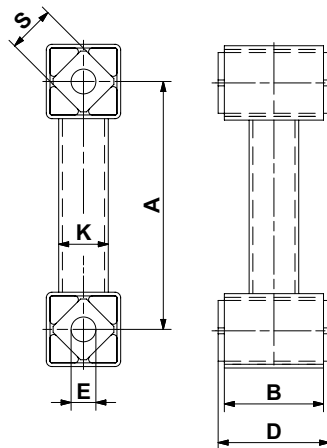
**AS-P / AS-PV**  
for flange fixation



Type AS-PV with inverted flange

Art. No.	Type	G [N] K<2	cd [N/mm]									Weight [kg]	Material structure	
				A	B	B1	C	D	E	øF	H			øK
07 081 001	AS-P 15	100	5	100	50	-	4	50	70	7	25	18	0.5	Steel welded constructions, ROSTA blue painted
07 091 001	AS-PV 15			-	56	-	5	60	85	9.5	35	24		
07 081 002	AS-P 18	200	11	120	62	-	5	60	85	9.5	35	24	0.8	
07 091 002	AS-PV 18			-	68	-	5	80	110	11.5	45	34		
07 081 003	AS-P 27	400	12	160	73	-	5	80	110	11.5	45	34	1.4	
07 091 003	AS-PV 27			-	80	-	6	100	140	14	60	40		
07 081 004	AS-P 38	800	19	200	95	-	6	100	140	14	60	40	3.6	
07 091 004	AS-PV 38			-	104	-	8	130	180	18	70	45		
07 081 005	AS-P 45	1'600	33	200	120	-	8	130	180	18	70	45	5.5	
07 091 005	AS-PV 45			-	132	-	10	140	190	18	80	60		
07 081 006	AS-P 50	2'500	37	250	145	-	10	140	190	18	80	60	8.3	
07 091 006	AS-PV 50			-	160	-								

**AS-C**  
for frictional center connection



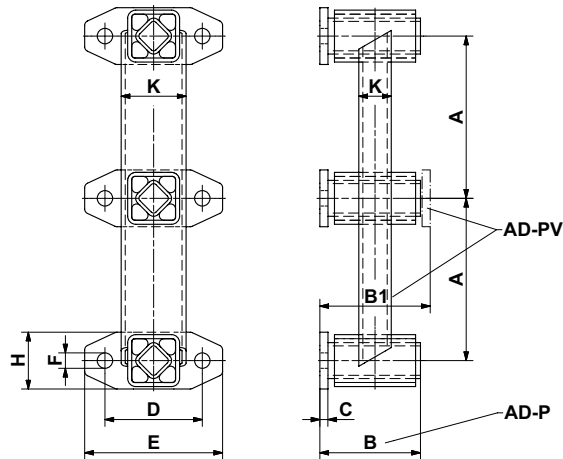
Art. No.	Type	G [N] K<2	cd [N/mm]							Weight [kg]	Material structure	
				A	B	D <sub>-0.3</sub>	øE	øK	□S		Inner square	Housing
07 071 001	AS-C 15	100	5	100	40	45	10 <sup>+0.4</sup> <sub>+0.2</sub>	18	15	0.4	Light metal profile	Steel welded construction, ROSTA blue painted
07 071 002	AS-C 18	200	11	120	50	55	13 <sup>0</sup> <sub>-0.2</sub>	24	18	0.6		
07 071 003	AS-C 27	400	12	160	60	65	16 <sup>+0.5</sup> <sub>+0.3</sub>	34	27	1.3		
07 071 004	AS-C 38	800	19	200	80	90	20 <sup>+0.5</sup> <sub>+0.2</sub>	40	38	2.6		
07 071 005	AS-C 45	1'600	33	200	100	110	24 <sup>+0.5</sup> <sub>+0.2</sub>	45	45	3.9		
07 071 006	AS-C 50	2'500	37	250	120	130	30 <sup>+0.5</sup> <sub>+0.2</sub>	60	50	6.1		

G = max. load in N per rocker, by higher K consult chapter 5 on page 2.24.  
cd = dynamic spring value by oscillation angles  $\alpha \pm 5^\circ$  in speed range of  $n_s = 300-600 \text{ min}^{-1}$

Further basic information and calculations on pages 2.22-2.24.

# Double Rockers

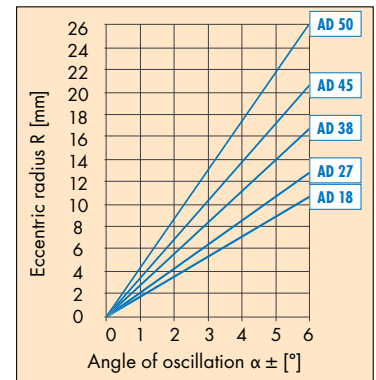
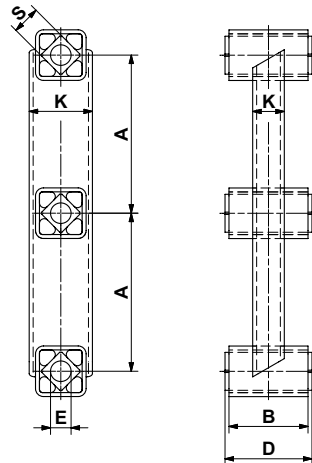
**AD-P /  
AD-PV**  
for flange  
fixation



Type AD-PV with inverted flange

Art. No.	Type	G [N]		c <sub>d</sub> [N/mm]	A	B	B1	C	D	E	øF	H	K	Weight [kg]	Material structure
		K=2	K=3												
07 111 001	<b>AD-P 18</b>	150	120	23	100	62	-	5	60	85	9.5	35	40 x 20	1.2	Steel welded constructions, ROSTA blue painted
07 121 001	<b>AD-PV 18</b>					-	68								
07 111 002	<b>AD-P 27</b>	300	240	31	120	73	-	5	80	110	11.5	45	55 x 34	2.6	
07 121 002	<b>AD-PV 27</b>					-	80								
07 111 003	<b>AD-P 38</b>	600	500	45	160	95	-	6	100	140	14	60	70 x 50	5.0	
07 121 003	<b>AD-PV 38</b>					-	104								
07 111 004	<b>AD-P 45</b>	1'200	1'000	50	200	120	-	8	130	180	18	70	80 x 40	8.5	
07 121 004	<b>AD-PV 45</b>					-	132								
07 111 005	<b>AD-P 50</b>	1'800	1'500	56	250	145	-	10	140	190	18	80	90 x 50	12.9	
07 121 005	<b>AD-PV 50</b>					-	160								

**AD-C**  
for frictional  
center connection



Art. No.	Type	G [N]		c <sub>d</sub> [N/mm]	A	B	D <sub>-0.3</sub>	øE	K	□S	Weight [kg]	Material structure	
		K=2	K=3									Inner square	Housing
07 101 001	<b>AD-C 18</b>	150	120	23	100	50	55	13 <sub>-0.2</sub> <sup>0</sup>	40x20	18	0.8	Light metal profile	Steel welded construction, ROSTA blue painted
07 101 002	<b>AD-C 27</b>	300	240	31	120	60	65	16 <sub>+0.2</sub> <sup>+0.5</sup>	55x34	27	1.8		
07 101 003	<b>AD-C 38</b>	600	500	45	160	80	90	20 <sub>+0.2</sub> <sup>+0.5</sup>	70x50	38	4.1		
07 101 004	<b>AD-C 45</b>	1'200	1'000	50	200	100	110	24 <sub>+0.2</sub> <sup>+0.5</sup>	80x40	45	6.1		

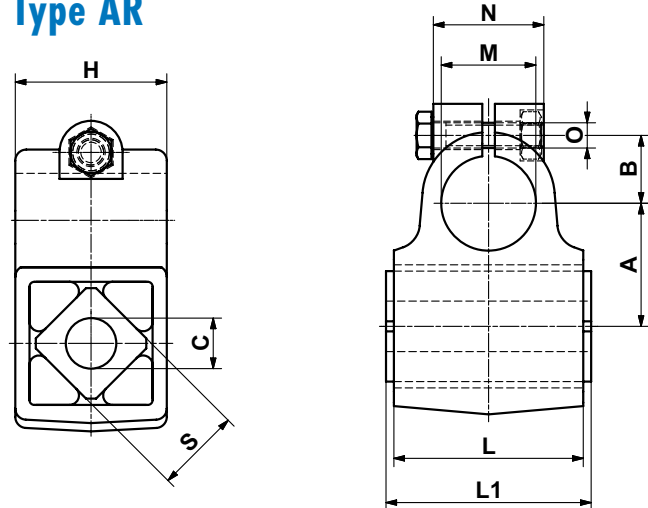
G = max. load in N per rocker, by different K consult chapter 5 on page 2.24.

c<sub>d</sub> = dynamic spring value by oscillation angles  $\alpha \pm 5^\circ$  in speed range of  $n_s = 300-600 \text{ min}^{-1}$



# Oscillating Mountings

## Type AR

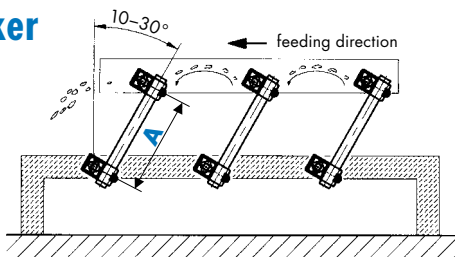


Art. No.	Type	G [N] K<2	Mdd [Nm/°]											Weight [kg]	Material structure	
				A±0.2	B	øC	H	L	L1 <sub>-0.3</sub>	øM	N	O	□S		Inner square	Housing
07 291 003	AR 27	400	2.6	39	21.5	16 <sup>+0.5</sup> <sub>+0.3</sub>	48	60	65	30	35	M8	27	0.5	Light metal profile	Light metal casting, ROSTA blue painted
07 291 004	AR 38	800	6.7	52	26.5	20 <sup>+0.5</sup> <sub>+0.2</sub>	64	80	90	40	50	M8	38	1.0		

G = max. load in N per rocker, by higher K consult chapter 5 on page 2.24.

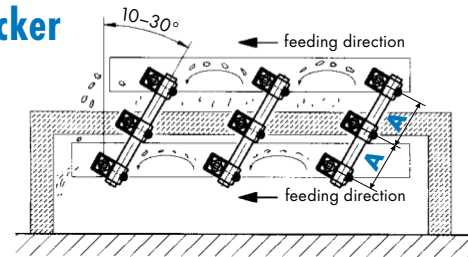
Mdd = dynamic element torque in Nm/° by oscillating angles  $\alpha \pm 5^\circ$  in speed range of  $n_s = 300-600 \text{ min}^{-1}$

### Single Rocker



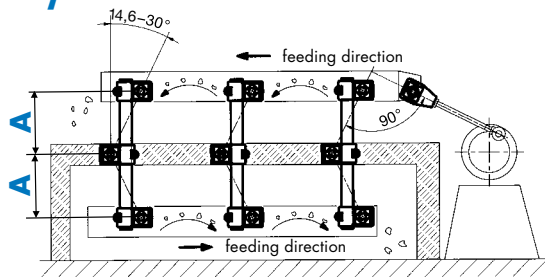
The two AR mounts are inserted on the round connecting tube. The required center distance should be positioned on the straightening plate (parallelism), subsequently tightening of the two collars with the required fastening torque.

### Double Rocker



The three AR mountings are inserted on the round connecting tube (please check required material thickness by the relevant center distance on below-mentioned table). The counter-mass can be used as second trough with identical feeding direction.

### Two-Way Rocker



The three AR mounts are inserted on the round connecting tube, with the direction inverted center element. This so said "boomerang"-configuration is offering on the counter-mass trough a direction inverted flow of material, what could simplify selection and screening processing.

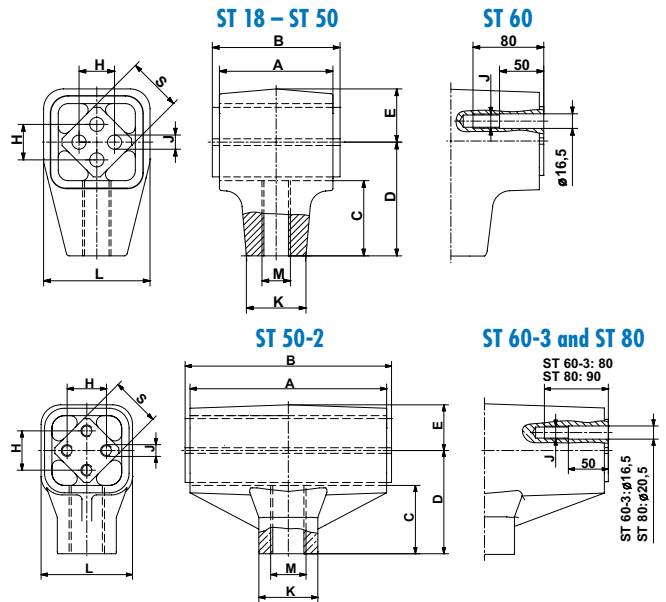
### Dimensioning of the connecting tubes

The connecting tubes have to be provided by the customer. For Single Rockers the wall thickness of 3 mm (up to center distance A = 300 mm) is fully sufficient. For Double Rockers, due to resulting shear forces, higher wall thicknesses are required – see below-mentioned table.

Type	Tube-ø	min. thickness of tube	max. center distance A	min. mounting angle $\beta$ [°] with two-way rocker
AR 27	30	3	160	26.0
		4	220	19.5
		5	300	14.6
AR 38	40	3	200	27.5
		4	250	22.6
		5	300	19.1

# Drive Heads

## Type ST



Art. No.	Type	F max. [N]	n <sub>s</sub> [min <sup>-1</sup> ] max. α <sub>ST</sub> ± 5°	Dimensions [mm]										Weight [kg]	Material structure	Bolting on inner square	
				A	B	C	D	E	H	J <sup>+0.5</sup>	□K	L	M				□S
07 031 001	ST 18	400	600	50	55 <sup>0</sup> <sub>-0.3</sub>	31.5	45	20	12 ± 0.3	6	22	39	M12	18	0.2	Light metal casing	End-to-end screw or threaded bar quality 8.8
07 041 001	ST 18L			M12-LH	18												
07 031 002	ST 27	1'000	560	60	65 <sup>0</sup> <sub>-0.3</sub>	40.5	60	27	20 ± 0.4	8	28	54	M16	27	0.4	Light metal casing	End-to-end screw or threaded bar quality 8.8
07 041 002	ST 27L			M16-LH	27												
07 031 003	ST 38	2'000	530	80	90 <sup>0</sup> <sub>-0.3</sub>	53	80	37	25 ± 0.4	10	42	74	M20	38	1.1	Light metal casing	End-to-end screw or threaded bar quality 8.8
07 041 003	ST 38L			M20-LH	38												
07 031 004	ST 45	3'500	500	100	110 <sup>0</sup> <sub>-0.3</sub>	67	100	44	35 ± 0.5	12	48	89	M24	45	1.8	Light metal casing	End-to-end screw or threaded bar quality 8.8
07 041 004	ST 45L			M24-LH	45												
07 031 005	ST 50	6'000	470	120	130 <sup>0</sup> <sub>-0.3</sub>	69.5	105	47	40 ± 0.5	M12 x 40	60	93	M36	50	5.5	Nodular cast iron	screw quality 8.8
07 041 005	ST 50L			M36-LH	50												
07 031 015	ST 50-2	10'000	470	200	210 <sup>0</sup> <sub>-0.3</sub>	69.5	105	47	40 ± 0.5	M12 x 40	60	93	M36	50	6.9	Nodular cast iron	screw quality 8.8
07 041 015	ST 50-2L			M36-LH	50												
07 031 026	ST 60	13'000	440	200	210 ± 0.2	85	130	59	45	M16	80	117	M42	60	15.6	Nodular cast iron	Shoulder studs quality 8.8 for optimizing frictional connection
07 041 026	ST 60L			M42-LH	60												
07 031 016	ST 60-3	20'000	440	300	310 ± 0.2	85	130	59	45	M16	75	117	M42	60	20.2	Steel	Shoulder studs quality 8.8 for optimizing frictional connection
07 041 016	ST 60-3L			M42-LH	60												
07 031 027	ST 80	27'000	380	300	310 ± 0.2	100	160	77	60	M20	90	150	M52	80	36.7	Steel	Shoulder studs quality 8.8 for optimizing frictional connection
07 041 027	ST 80L			M52-LH	80												

n<sub>s</sub> = max. revolutions by oscillation angle ± 5°; if osc. angle is below, higher rpm's are applicable, consult "permissible frequencies" in the Technology part of the ROSTA general catalogue.

F<sub>max.</sub> → Calculation of the acceleration force F on page 2.22.

## Length of driving rod A<sub>ST</sub> and eccentric radius R

To follow the guidelines of the permissible frequencies the angle of oscillation α<sub>ST</sub> should not exceed ± 5.7°. This angle is corresponding to the ratio R : A<sub>ST</sub> of 1 : 10.

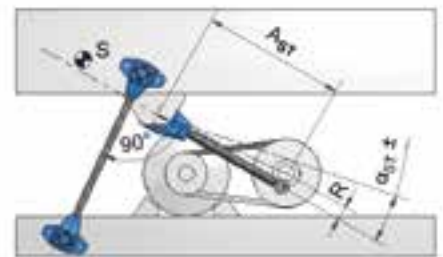
### Calculation of the oscillation angle for ST

Eccentric radius R [mm]  
 Center distance A<sub>ST</sub> [mm]  
 Oscillation angle α<sub>ST</sub> ± [°]

$$\alpha_{ST} = \arcsin\left(\frac{R}{A_{ST}}\right) [^\circ]$$

## Installation guidelines

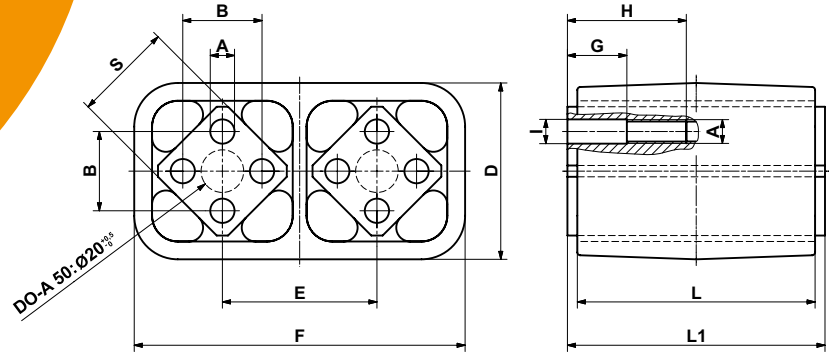
For the installation of the drive heads type ST under the trough-bottom it requires a stiff structure, ideally a heavy and rather long frame construction surrounding the power input from the eccentric drive. Too light and too short mounting structures for the drive heads could be submitted to early material fatigue and generate cracks on the feeding trough. The drive heads have to be installed fully free of play (frictional connection). By multiple power transmission with several drive heads, all driving rods have to be adjusted on exactly the same length. The force transmission from the eccentric drive should stay **right-angled** to the guiding rocker arms. This supports a smooth course of the shaker.



Series connection of 4 pcs. ST 50

# Spring Accumulators

## Type DO-A

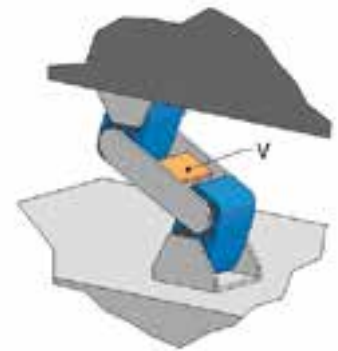


Art. No.	Type	$C_s$ [N/mm]	A	$B \pm 0.5$	D	E	F	$\phi I$	$\square S$	G	H	L	$L1_{-0.3}$	Weight [kg]	Material structure
01 041 013	<b>DO-A 45 x 80</b>	100	12 <sup>+0.5</sup>	35	85	73	150	-	45	-	-	80	90	1.9	Light metal profile, ROSTA blue painted
01 041 014	<b>DO-A 45 x 100</b>	125								-	-	100	110	2.3	
01 041 016	<b>DO-A 50 x 120</b>	190	M12	40	ca. 89	78	ca. 168	12.25	50	30	60	120	130	5.5	Light metal profile, nodular cast iron, ROSTA blue painted
01 041 019	<b>DO-A 50 x 160</b>	255								30	60	160	170	7.4	
01 041 017	<b>DO-A 50 x 200</b>	320								40	70	200	210	8.5	

$c_s$  = dynamic spring value of the complete accumulator by oscillating angle of  $\pm 5^\circ$  and revolutions  $n_s$  between 300–600  $\text{min}^{-1}$   
**1 spring accumulator is always consisting of 2 pcs. DO-A elements!**

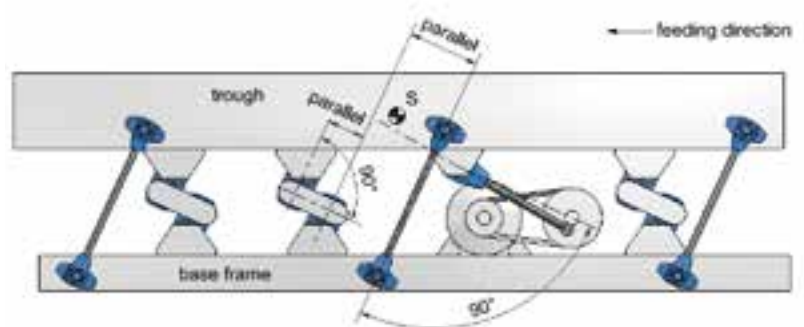
### Operating parameters

Angle of oscillation DO-A (series connection)	Accumulator cons. of <b>2 x DO-A 45</b>				Accumulator cons. of <b>2 x DO-A 50</b>			
	R	sw	max. $n_s$	max. K	R	sw	max. $n_s$	max. K
$\pm 6^\circ$	15.3	30.6	360	2.2	16.4	32.8	340	2.1
$\pm 5^\circ$	12.8	25.6	500	3.6	13.6	27.2	470	3.4
$\pm 4^\circ$	10.2	20.4	740	6.2	10.9	21.8	700	6.0



### Installation guidelines

The connection structures (forks) between the ROSTA DO-A elements have to be provided by the customer. The two side plates have to stay **right-angled** ( $90^\circ$ ) in regard to the DO-A element axis. It is recommendable to weld a cross bracing (V) between the side plates. The two DO-A elements of the accumulator have to stay **parallel** to each other and also **parallel** to the rocker arms of the trough. Their fixation on trough and base frame shall be made by means of a stiff fork structure. The fixation of the DO-A elements (on inner element section) shall be made with shoulder studs.



# ROSTA Oscillating Mountings and Accessories for Customized Applications

## Asymmetrical double rockers for high-speed shaker conveyors

To achieve highest material speed (up to 60 m/min) on shaker conveyors we recommend the installation of ROSTA double rocker arms with **asymmetrical center distances** between the elastic suspensions (ratio 2 : 1). Usually, the eccentric drive-input goes on the counter-mass frame which is connected to the **shorter arm end** and therefore weighs 200% of the upper feeding trough. The trough is connected to the **longer arm end** of the rocker. That is why it describes the **double stroke** in relation to the counter-mass. This gear ratio offers a long material throw on the trough by low reaction-force transmittance on the overall machine structure. Please ask for our special application manual **asymmetrical double rockers**.

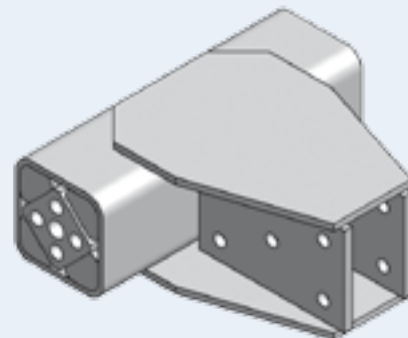


## Oversized drive heads for heavy-duty crank shaft driven shaker conveyors



The biggest standardized ROSTA drive head type **ST 80** is laid out to transmit acceleration forces up to 27'000 N on shaker troughs. For the actuation of e.g. heavy feeding hoppers or very long wood-waste shaker conveyors this capacity is not sufficient.

For the actuation of very large crank shaft driven shaker conveyors ROSTA also supplies the drive heads type **ST 80-4** and **ST 100-5** with acceleration force capacities  $F$  of **36'000 N** respectively **63'000 N** per head. These two heads are all made in steel welded construction and offer instead of the usually central tapped bore a **box-shaped holding fixture** for the drive rod (see drawing below). These two drive heads are not available from stock and will be manufactured only upon request (longer delivery time).

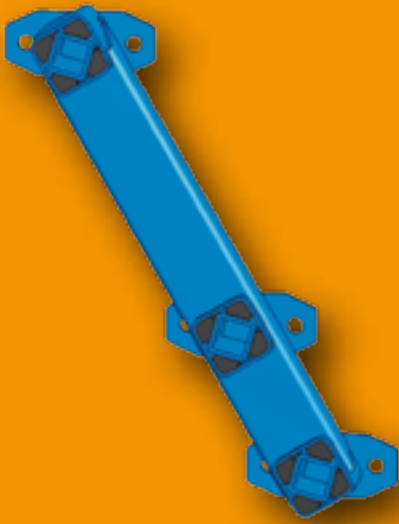


# ROSTA Oscillating Mountings and Accessories for Customized Applications

## ROSTA rocker arms AS-P and AD-P with shifted fixation flanges (30° position)

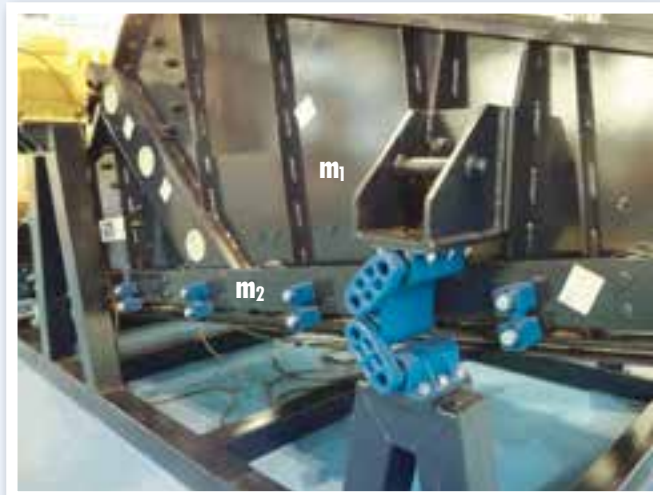
The fixation flanges of the standardized ROSTA single and double rocker arms type AS-P and AD-P are installed at right angle (90°) to the rocker arm axis. The practical experience showed that most of the shaker manufacturers install the rocker arms at inclination angle of 30° out of the vertical line to obtain an ideal combination of fast material feeding and high screening throw.

In case of very concise mounting conditions with low-pitched feeding troughs and slim machine frames and counter-masses the right-angled fixation flange sometimes protrudes the machine structure – and in extremely crowded constructions a bolted assembly through both flange bores is simply impractical. For such applications ROSTA offers as **customized parts** AS-P and AS-D rocker arms with fixation flanges staying 30° to the rocker arm axis allowing a very low mounting option of the rockers on trough and frame. Due to the rocker installation **by pairs** it is necessary to order **right** and **left hand** execution of the relevant rocker arms.



## ROSTA guiding rods for “Flip-Flow” two mass shaker systems

Free oscillating screening systems with counter-mass frames and directly actuated **flexible screen mats** offer the great benefit of the **mesh self-cleaning**. Furthermore, the flexible mats generate a **very high** and **wide material throw** on the screen deck. In these systems the counter-mass  $m_2$  does usually overswing the screen-box mass  $m_1$  at the ratio of 2 : 1 generating the so-called “Trampoline-Effect” with wide throws and the self-cleaning of the screen meshes. For the elastic suspension and the linear guiding of the counter-mass frames in “Flip-Flow” systems ROSTA offers different guiding-rods and spring accumulators, which are supporting the phase-shifted acting of the two masses. (Please ask for our manual “**Dual Amplifying Systems**”).



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Two-mass "natural frequency" shaker conveyor equipped with double rocker arms made out in light metal casting



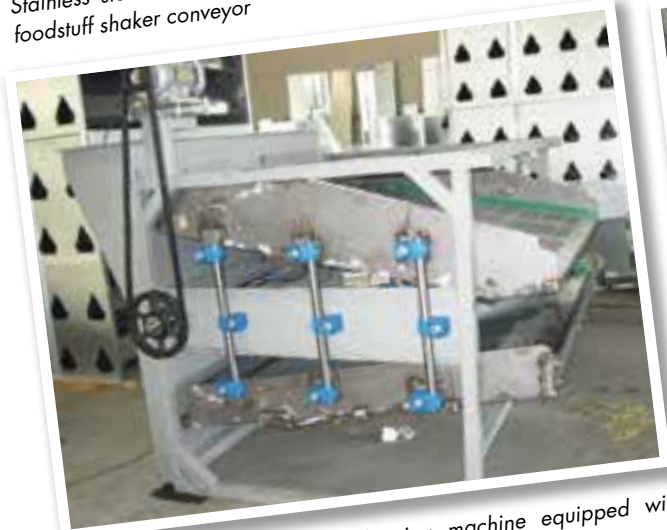
Two-mass shaker conveyor for the transport of bulk material equipped with double rocker arms AD-P 50



Stainless steel rocker arms in welded construction supporting a foodstuff shaker conveyor



One mass shaker conveyor with built-in screening fraction for the transport and sorting of wood-chips



Two-directional acting seed cleaning machine equipped with AR-"Boomerang" double rocker arms



20-meter long two mass shaker conveyor for tobacco leaves equipped with double rocker arms AD-PV 45

# Gyratory sifter machines (plan sifter) Technology



## Introduction

Gyratory sifters stay mainly in use in the processing sectors of the flour and grain conditioning, in the pharmaceutical powder preparation and in the chipboard industry for the selection and cleaning of the different wood-chip sizes.

The circular screening motion is offering a fast and complete covering of the entire screen surface = very high throughput.

## Customized solutions

Oscillating Mountings



Gyratory screening machine installed on 8 pcs. AK-I 40 universal joints (joints made out of stainless steel)



Wood-chip sorting screen mounted on 8 pcs. AK 100-4 suspensions



Free oscillating gyratory sifter for the flour selection on 8 pcs. AV 38 elements



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## Hanging gyratory sifters

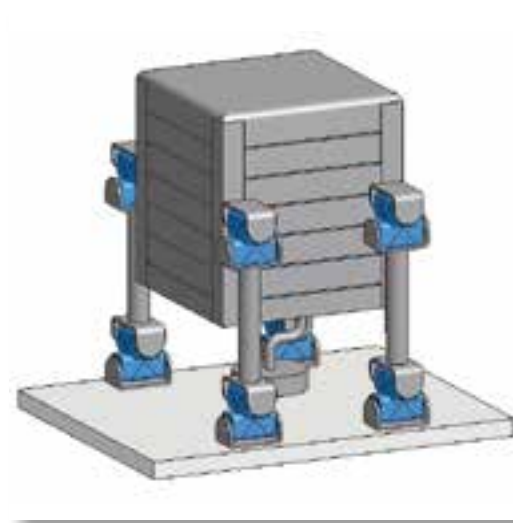
Hanging gyratory sifters are almost exclusively used in the milling sector for the sorting of the different types of flour (white flour, dark flour, black flour). These screens, which are equipped with a central unbalanced shaft, normally hang from the building ceiling on rattan or round fibre-glass rods. Due to the relatively high weight of the screening machines, several rattan or fibre-glass rods are needed at each corner of the box to ensure the suspension. In cases of very high humidity in the buildings, both types of rods can slip out of the clamps. Furthermore, it is very difficult to set it up so that all the rods support approximately the same weight.

For these applications, ROSTA recommends the use of the AV mounts, which have a very high carrying capacity. Only one mounting set is thereby needed for each corner of the screening box. In addition, the AV mountings can be delivered with right-hand and left-hand threads, which facilitates the horizontal adjustment of the box. The AV mountings have a long service life, and do not have to be periodically replaced, as it is the case with the rattan rods.



## Upright staying gyratory sifters with eccentric shaft drive

Upright staying gyratory sifter machines frequently have this classical type of crank drive. These screens are mainly used in the flour processing sector, as well as in chipboard manufacturing plants. An eccentric shaft driven by belts transfers the circular movement to the screen box. The screen box is supported by four legs, each consisting of two ROSTA universal joints. The weight of the box lies completely on the four supports, which accurately guide the box movement.



## Upright staying gyratory sifters with unbalanced shaft drive

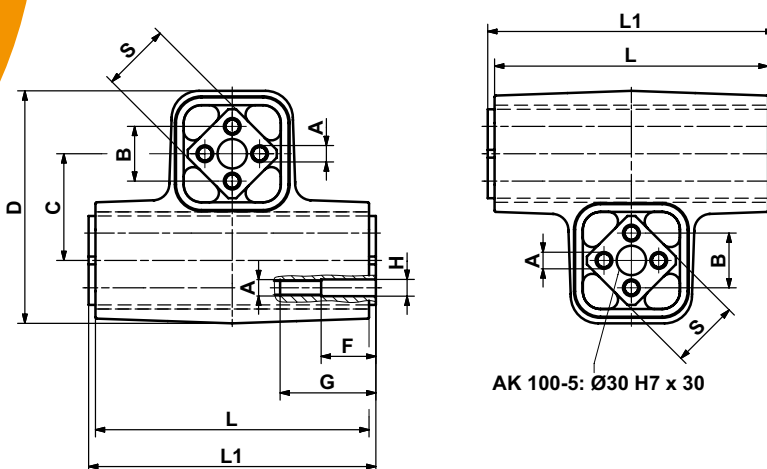
A very cost-efficient version of the upright staying gyratory sifter. Requires no complicated eccentric drive. The AK mountings or even the AV mountings must be over-dimensioned, however, due to the lack of a precisely defined guidance.

Please contact ROSTA for projects using upright staying gyratory sifters with unbalanced shaft drive.



# Oscillating Mountings for Gyratory Sifters

## Type AK – Universal Joints



Art. No.	Type	Max. load G [N] by system:			A	B	C	D	F	G	ø H	L	L1 ±0.2	□ S
		hanging	staying crank driven	staying free oscillating										
07 061 001	<b>AK 15</b>	160	128	80	5 <sup>+0.5</sup>	10 <sup>±0.2</sup>	27	54	-	-	-	60	65	15
07 061 002	<b>AK 18</b>	300	240	150	6 <sup>+0.5</sup>	12 <sup>±0.3</sup>	32	64	-	-	-	80	85	18
07 061 003	<b>AK 27</b>	800	640	400	8 <sup>+0.5</sup>	20 <sup>±0.4</sup>	45	97	-	-	-	100	105	27
07 061 004	<b>AK 38</b>	1'600	1'280	800	10 <sup>+0.5</sup>	25 <sup>±0.4</sup>	60	130	-	-	-	120	130	38
07 061 005	<b>AK 45</b>	3'000	2'400	1'500	12 <sup>+0.5</sup>	35 <sup>±0.5</sup>	72	156	-	-	-	150	160	45
07 061 011	<b>AK 50</b>	5'600	4'480	2'800	M12	40 <sup>±0.5</sup>	78	172	40	70	12.25	200	210	50
07 061 012	<b>AK 60</b>	10'000	8'000	5'000	M16	45	100	218	50	80	16.5	300	310	60
07 061 013	<b>AK 80</b>	20'000	16'000	10'000	M20	60	136	283	50	90	20.5	400	410	80
07 061 009	<b>AK 100-4</b>	30'000	24'000	15'000	M24	75	170	354	50	100	25	400	410	100
07 061 010	<b>AK 100-5</b>	40'000	32'000	20'000	M24	75	170	340	50	100	25	500	510	100

G = max. load in N per support column

Art. No.	Type	Weight [kg]	Material structure			Bolting on inner square
			Inner square	Housing	Protection	
07 061 001	<b>AK 15</b>	0.4	Light metal profile	Steel welded construction	ROSTA blue painted	End-to-end screw or threaded bar quality 8.8
07 061 002	<b>AK 18</b>	0.6				
07 061 003	<b>AK 27</b>	1.9				
07 061 004	<b>AK 38</b>	3.7				
07 061 005	<b>AK 45</b>	6.7				
07 061 011	<b>AK 50</b>	11.4	Steel	Nodular cast iron		Shoulder studs quality 8.8 for optimizing frictional connection
07 061 012	<b>AK 60</b>	37.4				
07 061 013	<b>AK 80</b>	85.4				
07 061 009	<b>AK 100-4</b>	124				
07 061 010	<b>AK 100-5</b>	137		Steel welded construct.		

### Usual drive parameters out of practice

- Driving speed  $n_s$  up to approx. 380 min<sup>-1</sup>
- Oscillation angle  $\alpha$  up to approx.  $\pm 3.5^\circ$

### General advises

The operating parameters shall not exceed the guidelines of the "frequency spectrum" in the Technology part of the ROSTA general catalogue.

# Calculation Example

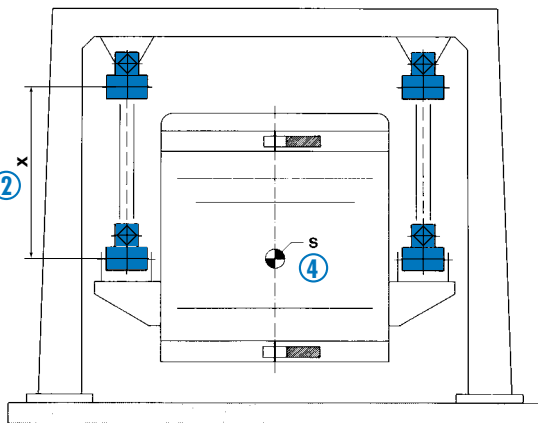
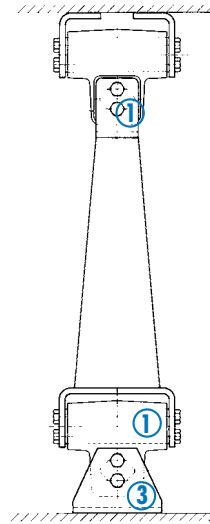
Machine type: staying sifter with positive crank drive

Description	Symbol	Example	Unit	Calculation formula
Total oscillating mass (material included)	m	1600	kg	<b>Angle of oscillation</b> $\alpha = \arctan \left( \frac{R}{X} \right) [^\circ]$
Eccentric radius	R	25	mm	
Length of support column	X	600	mm	
Angle of oscillation (out of R and X)	$\alpha \pm$	2.4	°	
Revolutions	$n_s$	230	min <sup>-1</sup>	<b>Load per column</b> $G = \frac{m \cdot g}{z} [N]$
Quantity of support columns	z	4	pcs.	
Load per column	G	3924	N	
Max. load capacity per column with AK 50 mounts	$G_{max}$	4480	N	

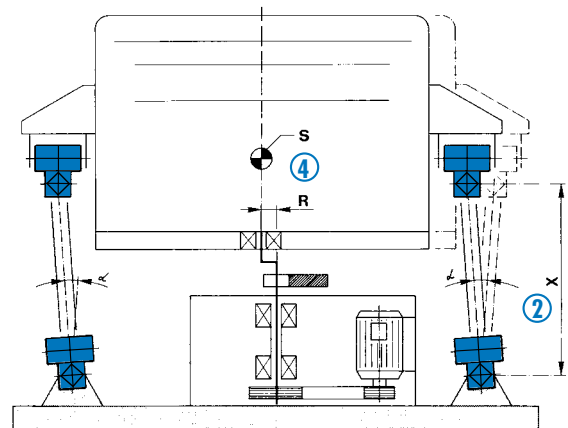
**Element selection:** 4 columns consisting of 2 pcs. AK 50 → **8 pcs. AK 50**

## Installation guidelines for AK universal joints

- 1 Install the two AK per column in the same line, in order that the distance X between the two inner squares of the 90° "distorted" element parts and the two inner squares of the "in-line" element parts is identical.
- 2 Install the four identical connection columns (provided by the customer) between the two AK. Also by slightly inclined screen-boxes the distance or length X of the connection columns has to be identical – compensate the inclination with e.g. the higher positioning of the fixation brackets by the discharge-end of the screen-box.
- 3 Up to the size AK 50 we do recommend to use our fixation brackets type **WS** for the AK mounting on machine frame and screen-box – see ROSTA general catalogue "Rubber suspensions".
- 4 To avoid unwanted tilting motions or screen-box distortions (by standstill) we do recommend the installation of the upper AK-brackets on the level of the center of gravity "S" of the screen-box.



Hanging and freely oscillating gyratory sifter

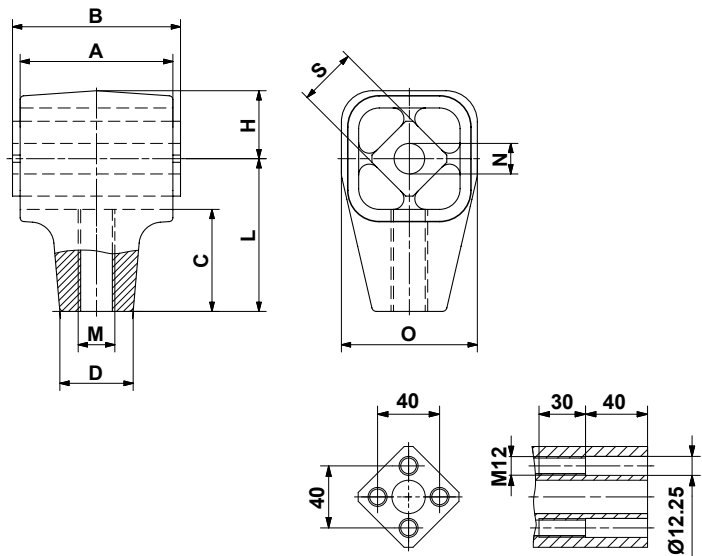


Staying gyratory sifter with positive crank shaft drive



# Oscillating Mountings for hanging Gyrotory Sifters

## Type AV



Inner square AV 50 and AV 50L

Art. No.	Type	G [N] per suspension	A	B $\pm 0.2$	C	□D	H	L	M	∅ N	O	□S
07 261 001	<b>AV 18</b>	600 – 1'600	60	65	40.5	28	27	60	M16	13 $_{-0.2}^0$	54	18
07 271 001	<b>AV 18L</b>								M16-LH			
07 261 002	<b>AV 27</b>	1'300 – 3'000	80	90	53	42	37	80	M20	16 $_{+0.3}^{+0.5}$	74	27
07 271 002	<b>AV 27L</b>								M20-LH			
07 261 003	<b>AV 38</b>	2'600 – 5'000	100	110	67	48	44	100	M24	20 $_{+0.2}^{+0.5}$	89	38
07 271 003	<b>AV 38L</b>								M24-LH			
07 261 014	<b>AV 40</b>	4'500 – 7'500	120	130	69.5	60	47	105	M36	20 $_{+0.2}^{+0.5}$	93	40
07 271 014	<b>AV 40L</b>								M36-LH			
07 261 005	<b>AV 50</b>	6'000 – 16'000	200	210	85	80	59	130	M42	-	116	50
07 271 005	<b>AV 50L</b>								M42-LH			

G = max. load in N per suspension  
 Elements for higher load on request

Art. No.	Type	Weight [kg]	Material structure			Bolting on inner square
			Inner square	Housing	Protection	
07 261 001	<b>AV 18</b>	0.4	Light metal profile	Light metal casting	ROSTA blue painted	End-to-end screw or threaded bar quality 8.8.
07 271 001	<b>AV 18L</b>					
07 261 002	<b>AV 27</b>					
07 271 002	<b>AV 27L</b>					
07 261 003	<b>AV 38</b>	1.7				
07 271 003	<b>AV 38L</b>					
07 261 014	<b>AV 40</b>	5.0	Nodular cast iron			
07 271 014	<b>AV 40L</b>					
07 261 005	<b>AV 50</b>	12.3			M12 shoulder studs quality 8.8.	
07 271 005	<b>AV 50L</b>					

### General advises

The operating parameters shall not exceed the guidelines of the "frequency spectrum", see Technology part in the ROSTA general catalogue.

**The threaded connection rod has to be provided by the customer.**

## Calculation Example

Description	Symbol	Example Unit	Calculation formula
Total oscillating mass (material included)	m	800 kg	<b>Angle of oscillation</b>
Eccentric radius ②	R	20 mm	
Length of suspension rod	X	600 mm	$\beta = \arctan\left(\frac{R}{X}\right) [^\circ]$
Angle of oscillation (out of R and X), shall not exceed $\pm 2^\circ$ ②	$\beta \pm$	$1.9^\circ$	<b>Load per suspension rod</b>
Revolutions	$n_s$	$230 \text{ min}^{-1}$	
Quantity of suspension rods	z	4 pcs.	
Load per suspension rod	G	1962 N	
Max. load capacity per rod with AV 27 mountings	$G_{\text{max}}$	3000 N	
			$G = \frac{m \cdot g}{z} [\text{N}]$

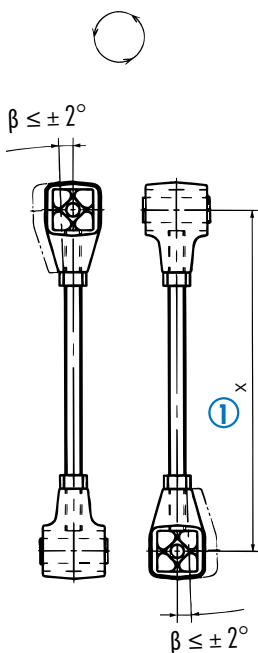
### Element Selection:

**4 pcs. AV 27 and 4 pcs. AV 27 L** (left-hand threaded), the two AV elements per suspension rod have to be installed crosswise ( $90^\circ$  offset).

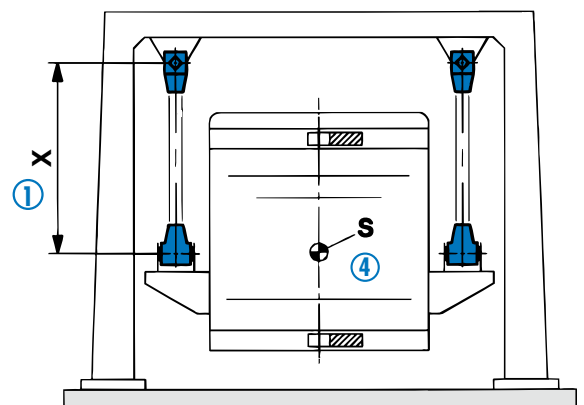
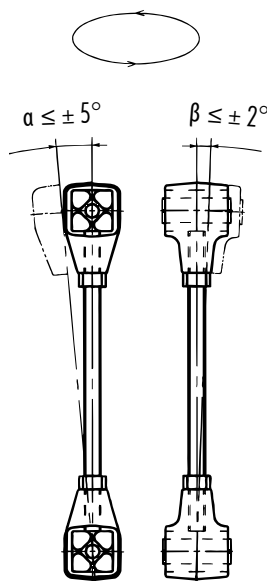
## Installation guidelines for AV mountings

- ① With the right-hand and left-hand threaded connection in the AV housing the length X of the suspension rod can easily be adjusted, this length has to be identical for all four suspension rods. **The indicated angular oscillating limitations have to be respected!**
- ② Only the **crosswise** ( $90^\circ$  offset) installation of the two AV elements per suspension rod is guaranteeing for a harmonic and circular motion of the screen-box.
- ③ The crosswise installation of the AV elements has to be identical on all four suspension rods, e.g. all upper AV mounts shall stay  $90^\circ$  offset. (For the suspension or support of the discharge-ends of "ROTEX" sifter types the two elements per rod shall stay parallel to each other.)
- ④ To avoid unwanted tilting motions or screen-box distortions (by standstill) we do recommend the installation of the lower AV-brackets on the level of the center of gravity "S" of the screen-box.
- ⑤ Please consult ROSTA by the selection of AV elements for staying, free oscillating gyratory sifters.

② circular oscillation



③ elliptical oscillation



# Swinging Applications!

Examples:



Oscillating Mountings



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