The Blue Ones from ROSTA

Components for machine construction

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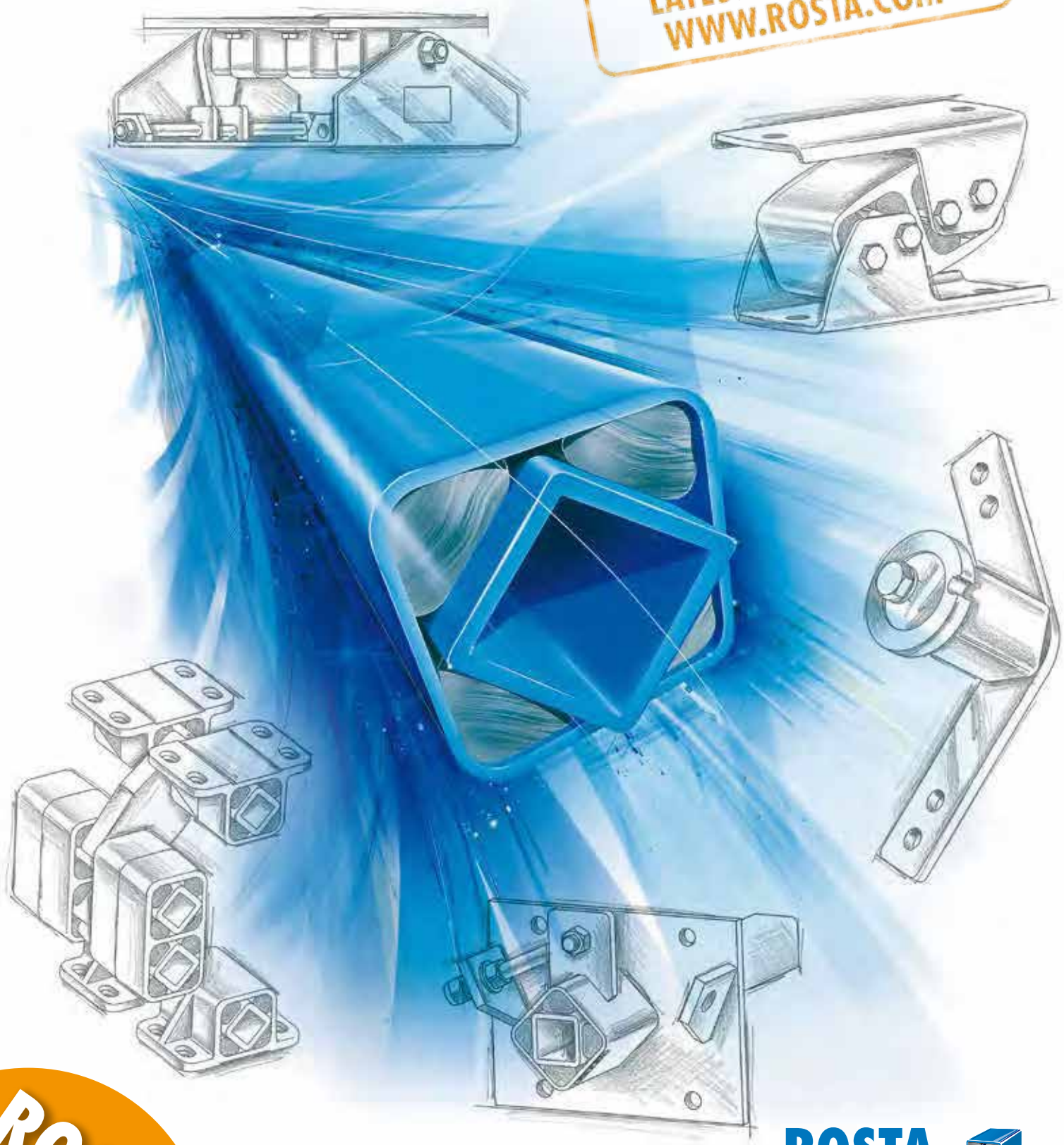

ROSTA
Since 1944

ROSTA
swinging solutions

ROSTA – We are in our element

We are in our element, whenever there is a need for **resilient suspensions, elastic supports, cushioning mounts** or **smooth guidance** in the machine industry – there is (almost) always a cost-efficient solution with our ROSTA rubber suspension elements!
We are in our element, when long service life, resistance to wear, durability and less maintenance are demanded – our jointed, rubber-metal torsion bearings can withstand (almost) everything and achieve "biblical" service lifes!
We are in our element, when we have to develop customised machine designs for our customers using ROSTA rubber suspension units – anything is feasible; our wide range of ideas, our laboratory equipment and our individual manufacturing processes are the guarantee for (almost) unlimited solutions!
We are in our element, when oscillations, vibrations and agitating movements in the processing industry have to select, separate and convey bulky materials – our rubber mounts offer the ideal solution for the suspension of (almost) every type of screen, conveyor or sifting machine!
We are in our element, when our customers need direct support and help in order to find a solution – the Blue Ones from ROSTA are (almost) always available from stock, and we also offer on-site customer service worldwide!

We look forward to your task – set us a challenge!
We will do (almost) anything for you!

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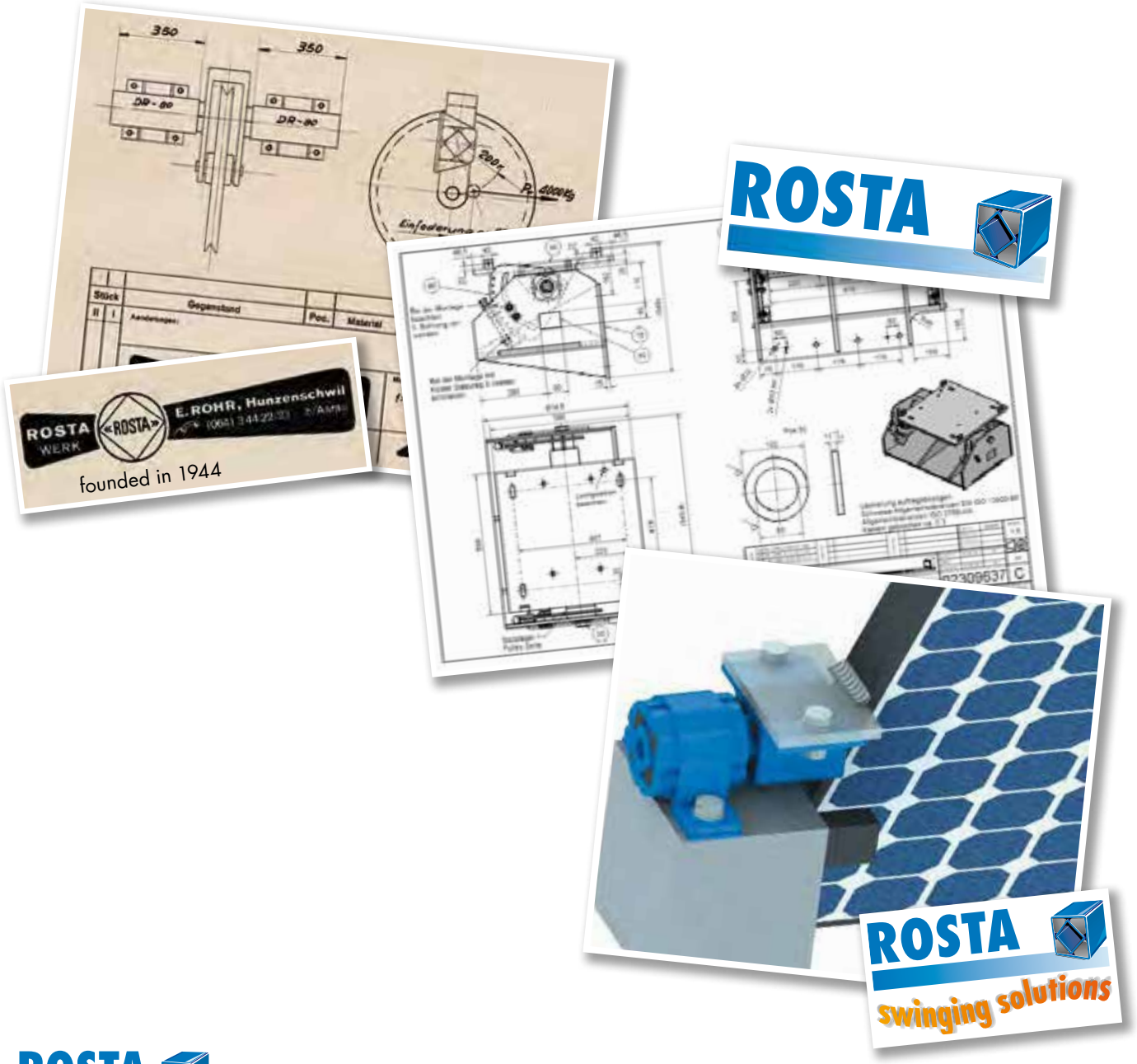
Table of contents

ROSTA – yesterday, today, tomorrow

It started in the mid forties with the production of a few elastic wheel suspensions and, over the years, developed into a company that manufactured standardised rubber suspension axes for trailers. But it was the design and marketing of machine components such as the unique **chain and belt tension elements** that opened up the world market for the ingenious ROSTA rubber suspension system. Best-selling machine components such as the vibratory suspensions **for screening technology** helped ROSTA rubber suspensions to achieve their international breakthrough. This was followed by **motorbases and anti-vibration mounts**, which have now become indispensable in general machine construction. ROSTA rubber suspension units will also make their mark in the future in machine construction technology – whether in the recycling industry or in the production of renewable energy – the **blue** spring-loaded assemblies from Hunzenschwil in Switzerland are already fully involved in these forward-looking technologies!



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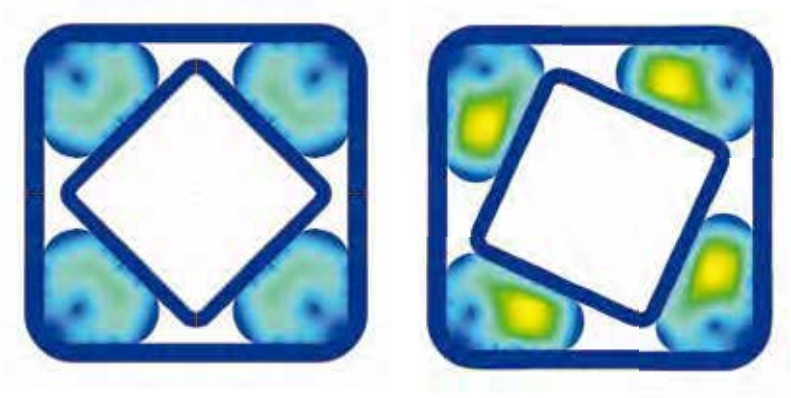
ROSTA – a unique spring system from experienced specialists

Quality validation obtains highest importance at ROSTA. The well-equipped Research and Development department leaves nothing to chance; the material tests that take place before and periodically during the series production are the guarantee for a **comprehensive quality standard** – a spare part element produced in ten years time will still have the same characteristics as the series product supplied today!



Production machines, handling equipments, tooling machines and processing systems equipped with state-of-the-art technology can only function perfectly if reliable and motivated employees of the manufacturer stand fully behind even the smallest structural components. It is their competence, their quality considerations and their great willingness to work that lay the foundations for the production of high quality goods. At ROSTA AG, we enjoy a very low staff fluctuation and make every effort to treat our employees with great respect and ensure that they feel that they are part of a large family— **the Blue Ones from ROSTA**.

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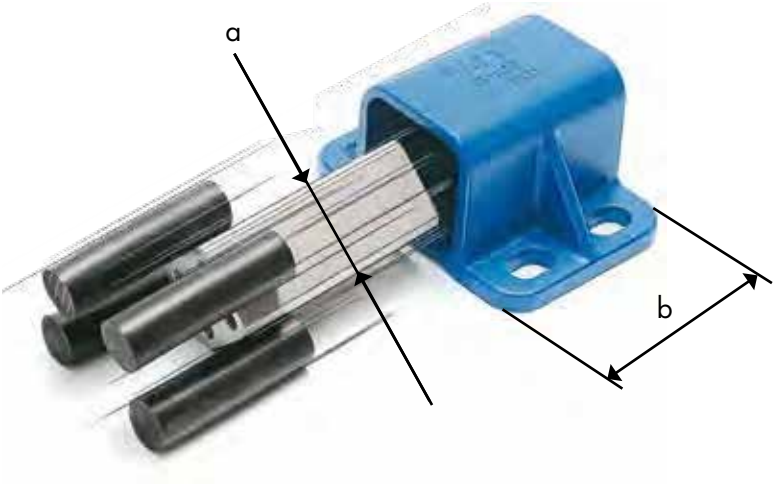
ROSTA Element Determination

The adjacent exploded view shows a rubber suspension **type DW-A 45 x 100**.

Wherefrom comes this (relatively old) designation **based on the German language?**

"D" stays for **D**rehelement (e: torsion-element)
"W" stays for **W**inkelsupport am Aussengehäuse (e: included fastening bracket)
"A" stays for **A**luminiuminnenvierkantprofil (e: core-profile made of aluminium)
"45" stays for the core dimension **45/45** mm (dimension a)
"100" stays for the effective element-length **100** mm (dimension b)

The following product catalogues are indicating the standardized element dimensions with numbers like **18** or **45** or **50** etc., always related to the dimension in mm of the inner element-core (dimension a). E.g. a type **AU 38** is a suspension for oscillating shaker troughs (g: **Au**fhängung = suspension) with inner core dimensions 38/38 mm.



An **AB 50** is an **Ab**stützung = support element for oscillating screens with inner core dimensions 50/50 mm, etc., etc.

Throughout the full product variety of ROSTA there are Rubber Suspension Units, Oscillating Mountings, Anti-vibration Mounts, Tensioner Devices and Motorbases in the following sizes (inner core dimension in mm): DR **11, 15, 18, 27, 38, 45, 50, 60, 70, 80** and **100** (not all final products are available in all afore mentioned DR-sizes).

Supplier of rubber inserts and subsidiary company of ROSTA AG: Compounds

In the end, the ROSTA rubber suspension element is only as good, as the rubber inserts mounted in it. Or in other words: If the rubber quality is not very good, the ROSTA element will not be able to deliver the required performance and characteristics.
For many years, ROSTA AG has been supplied with high-quality rubber inserts for its component production by two leading Swiss manufacturers of rubber profiles. The cooperation with these two suppliers was always excellent and very tight. There has, however, always been one downside to this good cooperation: **the very high supplier dependency!**
In the spring of 2007, the unique opportunity arose for ROSTA AG to purchase both the rubber mixing plant of the one long-term supplier and the extrusion and vulcanisation operation of the other. The two production branches were then merged together, creating the COMPOUNDS AG. In the year 2010, the company moved into its new, spacious production and administration building in CH-8330 Pfäffikon. Besides the covering of the supply-continuity, many new possibilities for the improvement of the quality and of developing rubber inserts for specific and/or customized applications will arise from the close collaboration with the "own" rubber supplier.

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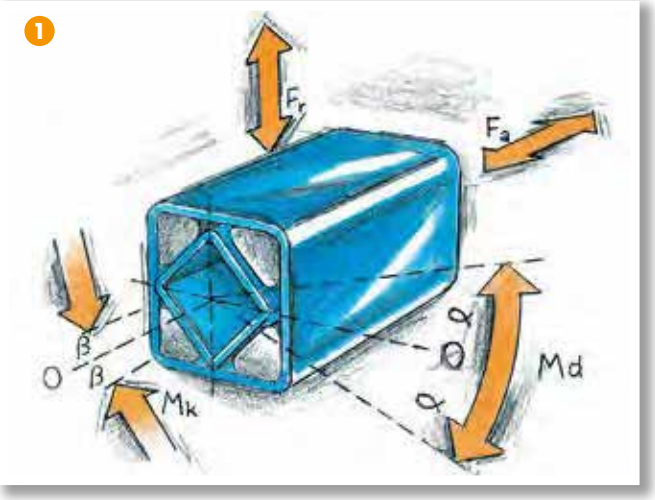
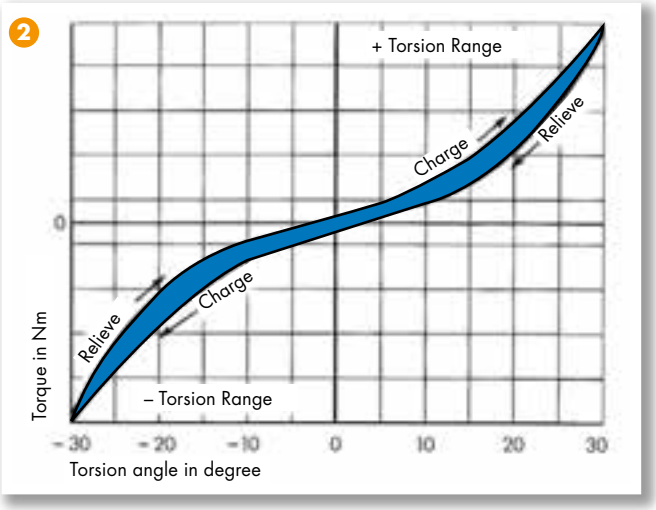
ROSTA Technology

1 Function

The ROSTA rubber suspension elements are mainly designed for applications as torsional spring devices offering operation angles of ± 30°. Depending on the particular function, not only torsional moments are generated by pivoting the spring device. According to the specific application additional radial F_r, axial F_a and/or cardanic M_k forces have usually to be taken in consideration. The occurring torques of the different element sizes and the additional load characteristics are indicated in the table on page **1.5**.



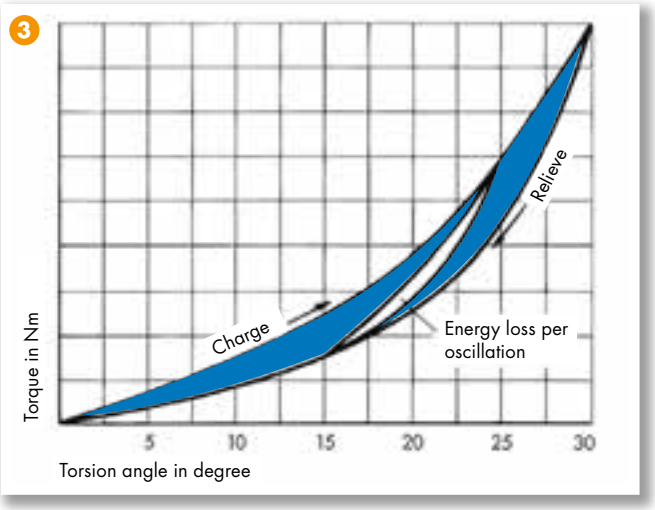


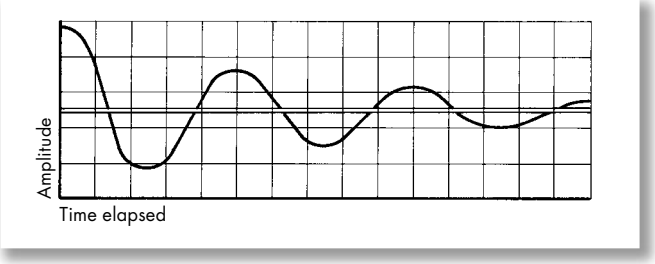
2 Spring Characteristic

By pivoting the unique ROSTA torsional spring device a virtually linear spring characteristic occurs with a slightly progressive upper end, when load is applied in the high pivoting range, close at 30° element rotation. If purely linear or even degressive spring characteristics are required, the design of the leverage has to be altered and/or a cam-disc has to be used as arm guidance in order to obtain a function adapted spring characteristic. Furthermore, please note that elastomeric bonds are incompressible, i.e. of constant volume.

3 Internal element damping

The occurring energy damping in the ROSTA element is addicted to the resulting energy loss work in the rubber inserts during the pivoting activity of the spring device. In the process of the element actuation a part of the resulting energy is transformed into frictional work generating heat. The shaded surface between load and relieve headline indicates the effective energy loss. At element actuation out of the zero position up to 30°, the resulting average energy loss is at 15 to 20%. At the actuation of a **pre-tensioned** element, the resulting ± working angle is usually only a few degrees, therefore the energy loss reduces within a limit (see graph: "Energy loss per oscillation").
Uniquely animated element oscillations fade within short term, due to the occurring energy loss at each following post-pulse oscillation. (Very important at the use of ROSTA screen mountings – during the operation procedure of the screen the resulting power loss in the ROSTA mountings is **negligible**; during the running down phase, close to the resonance frequency of the suspensions, an important amplitude exaggeration occurs. The high energy loss in the ROSTA screen mountings dampens and absorbs these exaggerations within only a few post-pulse oscillations.)





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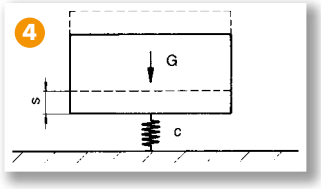
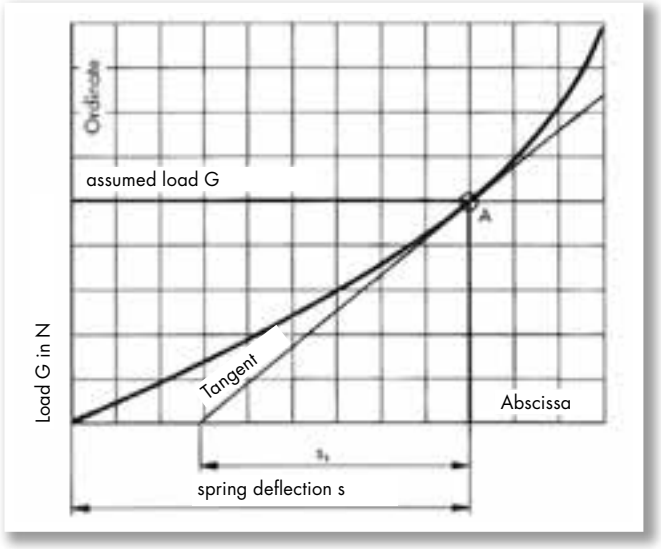




4 Natural Frequency of a ROSTA suspension

The determination of the natural frequency of a ROSTA suspension has to be carried out by spreading the tangent at the loading point "A" on the **parabolic arc** of the load deflection curve. The resulting distance $\mathbf{s}_1$ on the axis of abscissa comes up to the arithmetical spring deflection in mm, required for the determination of the natural frequency.

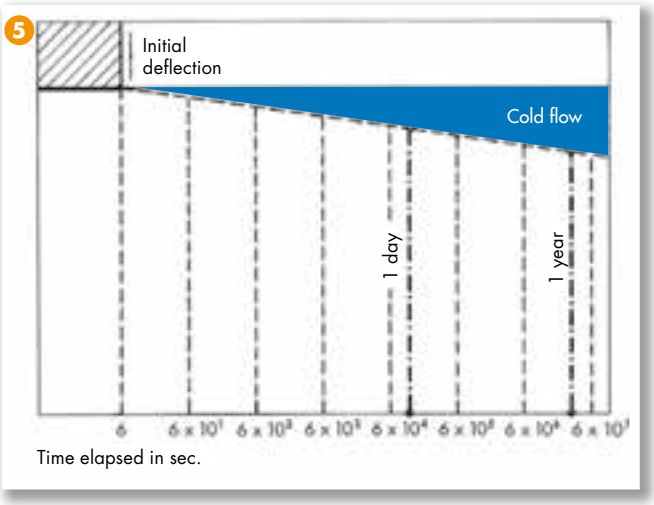
Natural frequency $n_e = \frac{300}{\sqrt{s_1}\ (\text{in cm})} = \text{min}^{-1}$

or $f_e = \frac{5}{\sqrt{s_1}\ (\text{in cm})} = \text{Hz}$

Example $s_1 = 5$ cm: $n_e = \frac{300}{\sqrt{5.0}} \cong 134\ \text{min}^{-1}$ or 2.2 Hz

5 Cold flow and settling of the rubber suspensions

If, over a certain period of time, load is permanently applied on an elastic component (e.g. rubber suspension) consistent deformation occurs (cold flow). Cold flow or settling appears during a linear logarithmic sequence. According to the respective diagram more than 50% of this overall settling or cold flow of a ROSTA element under load occurs after only one day of service. After approx. one year of operation the total cold flow deformation will be compensated (depending on environmental temperatures and applied frequencies). The empirical settling factor of a ROSTA rubber suspension lies within 3° to 5°, i.e. the inner core does not totally move back to the neutral 0° position of the element. In applications with series or parallel configurations of several elements (e.g. AB screen mountings) the effective cold flow factor lies at approx. +10% of the nominal deflection curve. This fact has to be taken into consideration while designing axle bearings or screen mountings with ROSTA elements.



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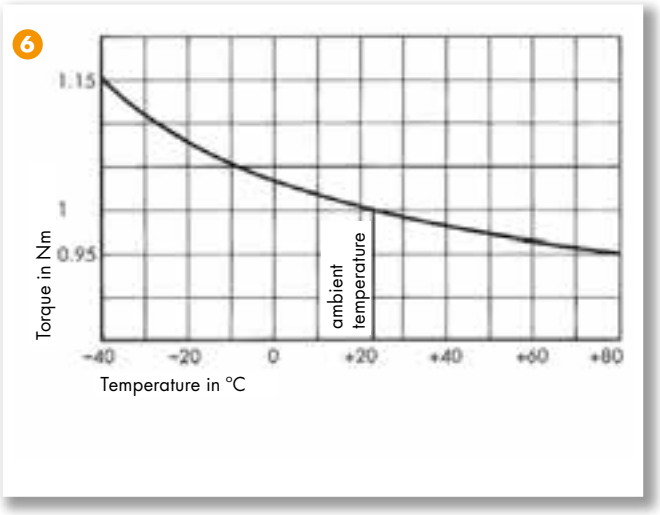
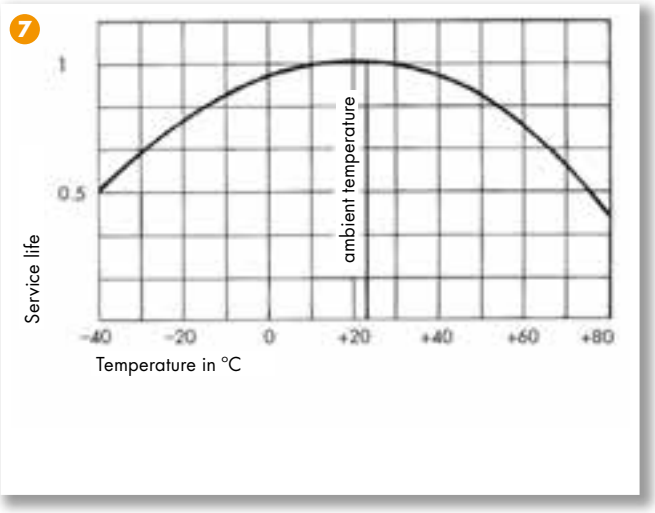


6 Temperature Influence

The ROSTA rubber suspension elements equipped with the standard rubber quality "Rubmix 10" are designed to be applied in the temperature range of –40 °C to +80 °C (–40 °F to +180 °F). With rising temperatures the mechanical stiffness of the rubber inserts and consequently the resulting element torque decrease within acceptable tolerances (at +80 °C approx. –5%). At lower temperatures (below the freezing point) the torsional element stiffness rises up to max. +15% at –40 °C. Furthermore, the internal damping factor (hysteresis) of the ROSTA rubber suspensions increases at lower temperatures and declines again at rising conditions. Due to the internal molecular friction through element torsion, the rubber inserts warm up in a continuous manner. Thus, the effective occurring element temperature can vary in relation to the environmental temperature.

7 Service Life

Provided the rubber suspension elements are selected according to our technical specifications, i.e. are operating within the given frequencies and oscillation angles and under the mentioned surrounding conditions, no loss of performance and functionality can be expected for many years. Extremely low or high **permanent** surrounding temperatures considerably shorten the lifetime expectancy of the rubber suspension elements. The opposite service life curve indicates the relevant life deduction at extreme ± temperatures from **factor 1** at room temperature of +22 °C.



8 Quality Control and Tolerances

Since December 1992 ROSTA AG has been an ISO 9001 standard certified **development, manufacture** and **distribution** company. All products are submitted to a periodical function and quality controlling. On the test machines of the in-house laboratory the rubber inserts are continuously tested and controlled with regard to Shore A hardness, compression set, abrasive wear, rebound resilience, tensile strength, breaking elongation and aging behaviour. The dimensional tolerance of the rubber inserts is defined according DIN 7715 standard and the Shore A hardness according to DIN 53505 standard. The housings and the inner-core profiles of the rubber suspensions are subjected to the tolerance guidelines of the relevant production process and respective supplier (e.g. casted, extruded, edge rolled) and the individual material consistence (e.g. light metal casting, steel tube, nodular cast iron part, etc.). The resulting torsional moments and spring deflections of the ROSTA rubber suspension elements are residing in a tolerance range of ± 15% **at most, but lie usually in an essentially narrower range!**

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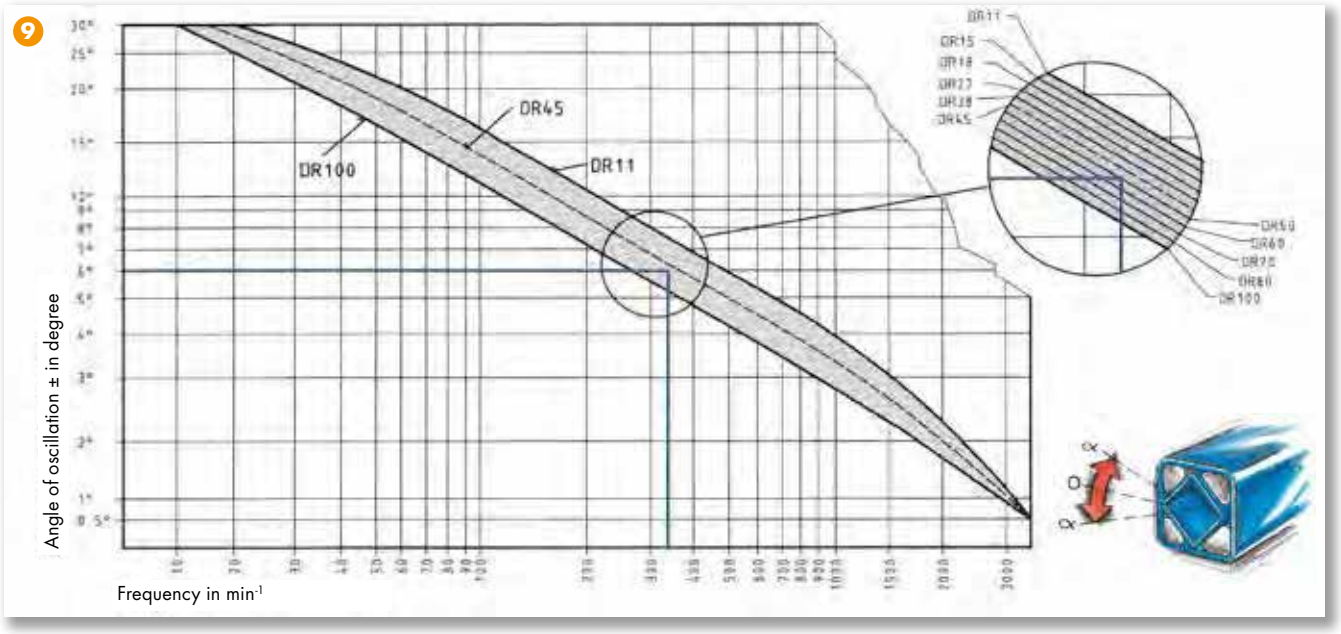
9 Permissible Element Frequencies

Alignment chart for the determination of the permissible frequencies at different angles of oscillation in relation to the appropriate element size (DR 11, 15, 18, etc.). The higher the frequency in rpm, the lower the angle of oscillation has to be and vice versa.

Example: (see blue indication on chart) A rubber suspension of type **DR 50** may be rotated from the neutral position (0°) to an oscillation angle of **± 6°** by a max. frequency of **340 min^{-1}**.
For applications of **"pre-tensioned"** elements working, **e.g.** under 15° of pre-tension and describing oscillation angles of ± 5° at 250 min^{-1}, it is **absolutely** necessary to consult ROSTA.

9



10 Rubber Qualities

Nearly 80% of all ROSTA rubber suspension elements are equipped with rubber inserts of standard quality "Rubmix 10". This rubber quality based on a high content of **natural rubber** (caoutchouc) offers a good shape-memory, small settling factors (cold flow), high mechanical load capacities and moderate aging behaviours (little hardening of the inserts). Where high **oil-consistency, heat-resistance** or **higher torque** is required, other qualities of elastomeric inserts can be applied in the ROSTA rubber suspension elements.

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Rubber quality	Factor in relation to the list "torque and loads" (page 1.5)	Working temperature	Rubber	Specification
Rubmix 10	**1.0**	–40 ° to +80 °C	NR	– Standard quality
Rubmix 20	**approx. 1.0**	–30 ° to +90 °C	CR	– Good oil-resistance – Elements marked with yellow dot
Rubmix 40	**approx. 0.6**	from +80 ° to +120 °C	EPDM-Silicone	– High temperature resistance – Elements marked with red dot
Rubmix 50	**approx. 3.0**	–35 ° to +90 °C	PUR	– Max. oscillation angle ±20° – Limited oscillation frequencies – No permanent water contact – Elements marked with green dot

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11 Chemical Consistency

The standardized ROSTA rubber suspension elements are equipped with elastic inserts of quality type "**Rubmix 10**". This rubber quality is based on a high content of natural rubber. It offers against large media a high chemical consistency. In some specific applications, however, some additional protective barrier or the application of elements with synthetical elastomeric inserts (qualities "Rubmix 20", "Rubmix 40" or "Rubmix 50") is required. Applying these alternative inserts, the general element characteristics slightly differ (see chapter 10 "rubber qualities"). The below indicated consistency table is merely a guideline and is incomplete. For specific applications please contact ROSTA and inform us about the environmental conditions and about the detailed concentration of liquid or aerial media being in contact with the rubber suspension elements.

11

Rubmix	10	20	40	50
Acetone	+	oo	++	oo
Alcohol	++	++	++	o
Benzene	oo	oo	oo	oo
Caustic soda solution up to 25% (20°)	++	++	++	oo
Citric acid	++	+	o	oo
Diesel	oo	+	oo	+
Formic acid	+	+	o	oo
Glycerine	+	+	++	oo
Hydraulic fluid	o	+	oo	oo
Hydrochloric acid up to 15%	++	+	o	oo
Javelle water	+	+	++	oo
Lactic acid	++	++	++	+
Liquid ammonia	+	+	++	oo
Lubricating grease and oil	oo	+	oo	+
Nitric acid up to 10%	oo	+	+	oo
Nitro thinner	oo	oo	oo	oo
Petrol (fuel)	oo	o	oo	++
Petroleum	oo	+	oo	++
Phosphoric acid up to 85%	oo	oo	oo	oo
Seawater	++	+	++	oo
Sulphuric acid up to 10%	+	o	o	oo
Tannic acid	++	+	++	oo
Toluene	oo	oo	oo	oo
Treacle	++	++	++	o

Legend:
- ++ excellent consistency
- + good consistency
- o sufficient consistency
- oo insufficient consistency

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ROSTA Stainless Steel Range

In the food processing and pharmaceutical industries the very high hygienic standards are raising permanently. We accommodate these facts in our component development through expanding and improving continuously our range of stainless steel machine components. As a result, many of the ROSTA oscillating and tensioning elements are as standard elements in stainless steel material available from stock. For production-related reasons some dimensions of our stainless steel elements do slightly differ from the measurements of the standard range (steel versions).

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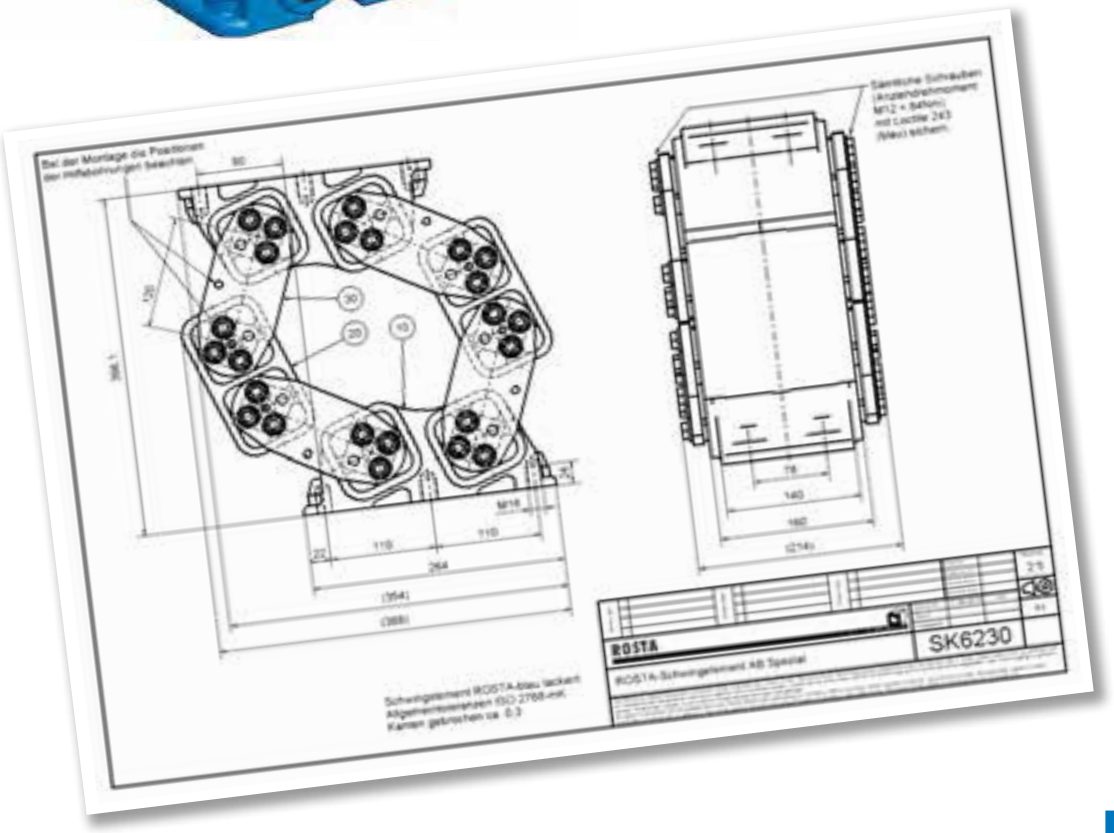
Please ask for our "stainless steel" catalogue!

ROSTA Customized Elements

Does the ready-made suit not fit your requirements, we will "tailor" it!

The proverbially worldwide availability of our **standardized rubber suspension elements** is one of the most positive arguments for the application of our products. By large batch production of machines and installations, however, a "**tailored**" and **customized** system component can significantly reduce the assembly time. In addition, the original equipment manufacturer gets the certitude that its customized ROSTA component is supplied **exclusively** to its organisation and consequently the potential spare part business stays under its own survey.

Please ask for a consulting call! We will be pleased to take measurement on your specific machine configuration for designing your customized ROSTA built-in part!



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ROSTA Rubber Suspensions

Springing – cushioning – guiding all three functions in one machine component! This proverbial triple function is raising the ROSTA rubber suspension system in the status of uniqueness among the machine components. The ROSTA technology, for years solely focusing on mechanical engineering and machine construction, is now continuously finding admission in equipments of human bodybuilding. Besides amusement installations, innumerable **open-air gymnastic parks** are raising up like mushrooms in our contemporary agglomerations. As expander hinge, as see-saw bearing or as stepping-stone cushion, the threefold function of the **indestructible** rubber suspension encouraged the relevant industries for the use of **the Blue Ones from ROSTA**.

Expander

Protective stepping cushion

See-saw bearing

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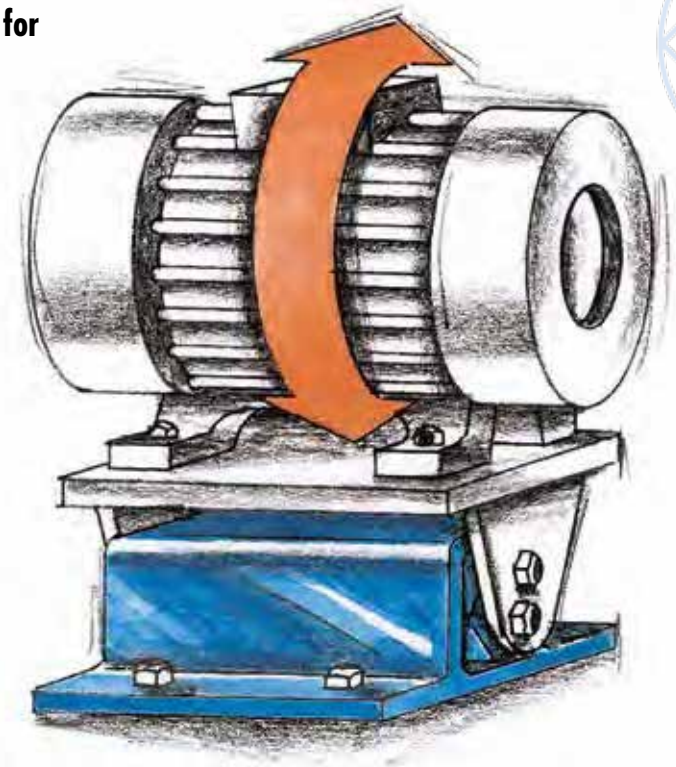
ROSTA Rubber Suspension Units

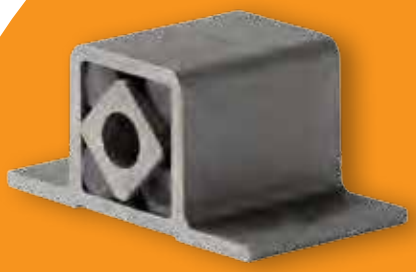
Multifunctional Modules for the Machine Industries
guiding – tensioning – absorbing

ROSTA
swinging solutions

ROSTA Rubber
torsion-elastic spring assemblies for

pendulum suspensions for unbalanced motors
torque supports for gear motors

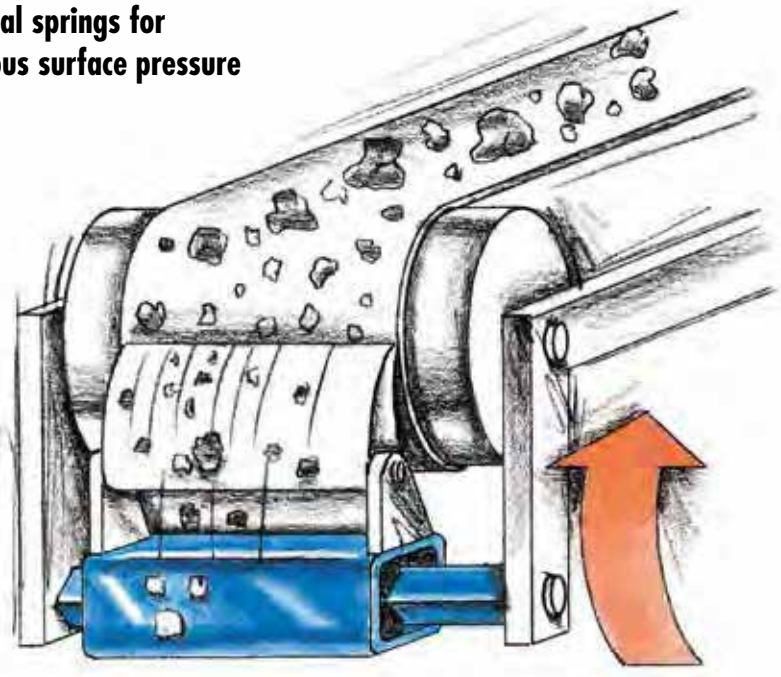




DW-C

DR-S

torsional springs for continous surface pressure



fully customized rubber suspensions in exclusive design according specific request

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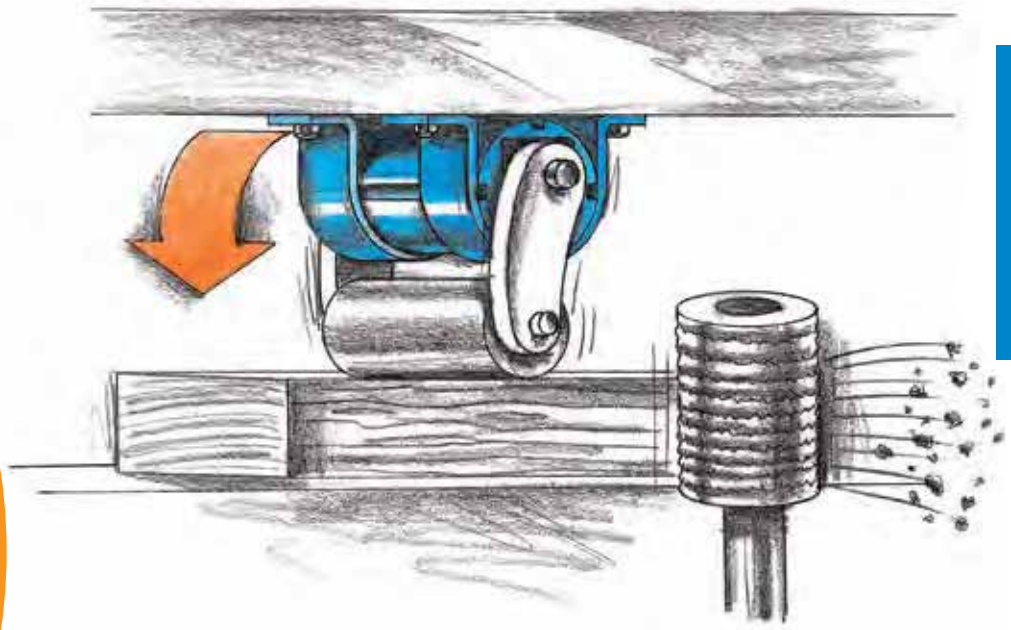
Suspension Units

the contemporary machine engineering

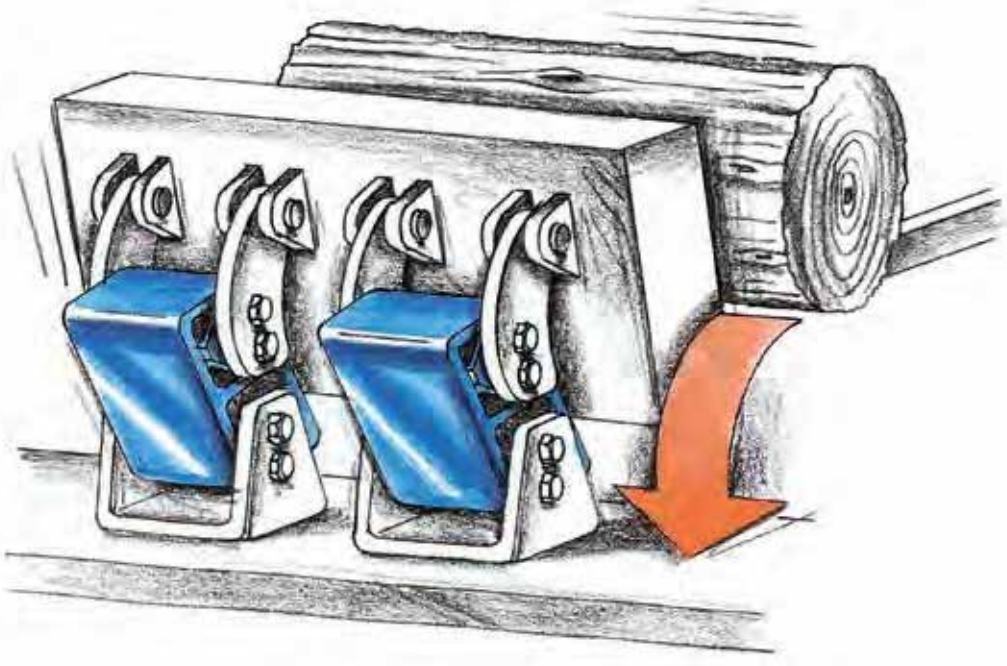
torsion elastic mounts offering constant pressure on workparts (infeed devices)



DK-A

DO-A

energy absorbing impact suspensions



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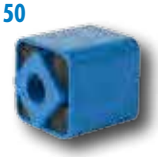
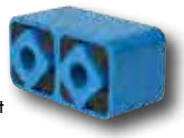
Selection chart for rubber suspension standard elements with Rubmix 10

Inner square / Housing	A Light metal profile, as from size 60 in steel	C Light metal profile	S Steel tube for plug-in connection	Accessories for housing Steel parts
DR Steel tube	**DR-A 15 to 50** Page 1.6 	**DR-C 15 to 50** Page 1.6 	**DR-S 11 to 50** Page 1.7 	**Bracket BR 11 to 50** Page 1.7 
DK Light metal profile	**DK-A 15 to 50** Page 1.8 	**DK-C** on request 	**DK-S 11 to 50** Page 1.8 	**Bracket BK 11 to 50** Page 1.9 
DW Light metal profile	**DW-A 15 to 38** Page 1.10 	**DW-C 15 to 38** Page 1.10 	**DW-S** on request 	Accessories for inner square A Steel parts
DW Nodular cast iron	**DW-A 45 and 50** Page 1.11 	**DW-C 45 and 50** on request 	**DW-S** on request 	**WS 11 to 50** Page 1.13 
DW Steel welded construction	**DW-A 60 to 100** Page 1.11 			
DO Light metal profile Size 50 in nodular cast iron	**DO-A 15 to 50** Page 1.12 	**DO-C** on request 	**DO-S** on request 	
Housing / Specification inner squares	Ideal for alternating motions over neutral element position. For sizes DR 15–45: Fixation by means of 2 to 4 persistent threaded bars (sizes DR 27–45 also available with threaded holes).	Friction locking of the core by means of one central bolt, can be positioned in full 360° angle-range. For ideal friction locking, please remove paint cover on face side. For alternating element motion of max. ±10°.	For plug-in connection with square profile*. Plug-in length min. 2 x width across flat "C". Connection is not recommendable by alternating motions – play between the plugged squares.	

* The square should be made out of bright steel, tolerance h9–h11. Possibly, the edges have to be overwinded (edge-radius in element profile max. 1.5 mm).

Specification

DR-A 15 x 25

- 15 – Effective element length
- S – Size S
- A – Inner square
- DR – Housing

General

- Light metal profiles: extruded profiles, seawater resistant (DIN 1725).
- Blue protection paint: water-soluble paint, coating thickness 0.04–0.08 mm.
- Fixation screws: minimum strength class of 8.8
- Welding on elements: do not weld on rubber suspensions – welding heat will affect or destroy the rubber inserts – ask for customized elements
- Most of the elements can be supplied in stainless steel version – also zinc-plated versions or special paintings are available.

Further customized elements: see examples on page 1.14 to 1.19.

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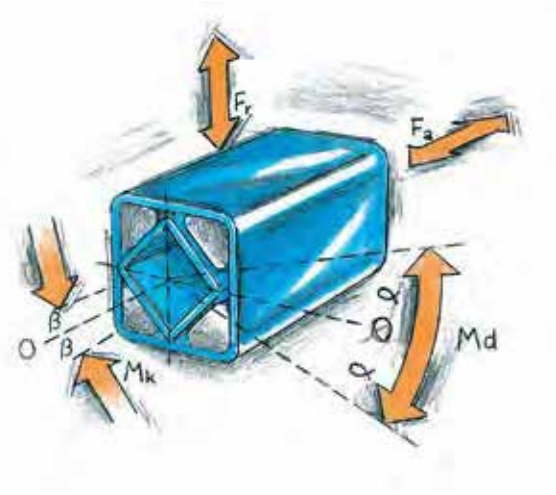
List of torque and loads

The values stated in the below mentioned list have been measured statically and are valid for the standard rubber quality "Rubmix 10". Intermediate values can be interpolated. By applications with combined dynamic forces and high angles of oscillation please consult our ROSTA general catalogue, chapter "Technology" or contact ROSTA.



Element			Torque						Cardanic	Radial		Axial	
Nominal size	x	Length	Md [Nm] angle ±α°						Mk [Nm] angle ±β°	Deflection ± s_r	Load F_r	Deflection ± s_a	Load F_a
			5°	10°	15°	20°	25°	30°	1°	[mm]	[N]	[mm]	[N]
11	x	20	0.3	0.8	1.3	2.0	2.9	4.0	0.4		200		60
		30	0.4	1.2	2.0	3.1	4.3	6.0	1.1	0.25	340	0.25	80
		50	0.7	2.0	3.4	5.1	7.2	10.0	5.6		600		150
15	x	25	0.7	1.6	2.6	4.0	5.7	8.2	0.6		200		70
		40	1.1	2.5	4.2	6.4	9.2	13.2	2.0	0.25	300	0.25	100
		60	1.6	3.8	6.3	9.6	13.8	19.8	5.5		500		160
18	x	30	1.9	4.5	7.5	11.0	15.0	20.6	1.6		400		80
		50	3.2	7.5	12.5	18.3	25.0	34.4	7.0	0.25	700	0.25	160
		80	5.1	12.0	20.0	29.3	40.0	55.0	28.0		1000		300
27	x	40	4.7	10.7	17.5	26.9	39.5	57.0	3.8		800		200
		60	7.0	16.0	26.3	40.3	59.3	85.5	11.5	0.5	1300	0.5	300
		100	11.7	26.7	43.8	67.2	98.8	142.5	48.0		2400		600
38	x	60	13.0	30.4	50.6	78.0	113.0	162.0	11.4		1500		300
		80	17.3	40.5	67.5	104.0	151.0	216.0	24.7	0.5	2000	0.5	500
		120	26.0	60.8	101.2	156.0	226.0	324.0	76.0		3000		600
45	x	80	27.6	62.4	104.0	160.0	222.0	320.0	28.0		1900		560
		100	34.5	78.0	130.0	200.0	278.0	400.0	54.0	0.5	3000	0.5	700
		150	51.8	117.0	195.0	300.0	420.0	600.0	140.0		4800		1000
50	x	120	51	133	250	395	570	780	80		2800		800
		160	77	197	363	570	820	1115	145	0.5	4500	0.5	950
		200	102	260	475	745	1070	1450	250		6300		1100
		300	150	385	700	1100	1590	2160	1200		8600		2200
60	x	150	75	170	300	460	700	1010	90		5400		1600
		200	95	220	385	610	930	1380	250	1.0	7200	1.0	2200
		300	140	365	630	995	1550	2240	900		9400		3200
70	x	200	140	380	650	1040	1490	2120	280		9000		2200
		300	190	525	910	1470	2160	3150	1200	1.0	12'000	1.0	3600
		400	250	765	1315	2160	3175	4750	2200		14'000		4000
80	x	200	200	500	850	1300	1900	2700	680		10'000		2500
		300	300	800	1300	2000	2900	4100	1500	1.0	15'000	1.0	3800
		400	400	1060	1800	2800	3900	5600	4600		19'000		4700
100	x	250	400	1080	1800	2800	4100	6300	1200		15'000		3200
		400	640	1700	2900	4500	6600	10'000	4300	1.0	28'000	1.0	5800
		500	800	2160	3600	5600	8200	12'000	8000		38'000		7500

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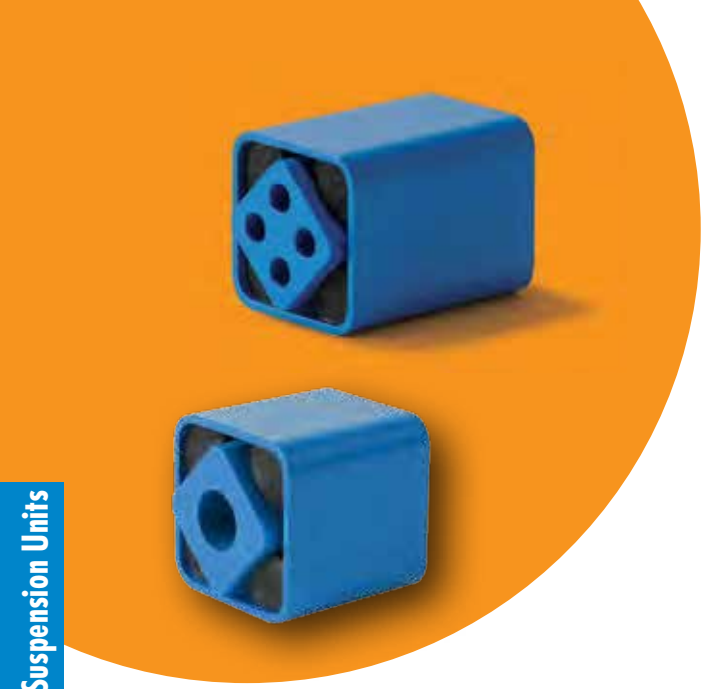
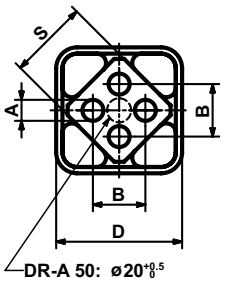
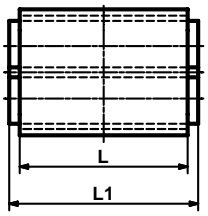


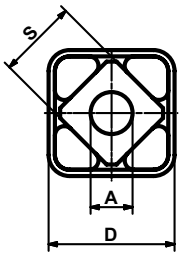
Rubber Suspension Units

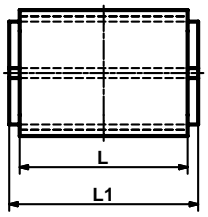
Type DR-A





Type DR-C



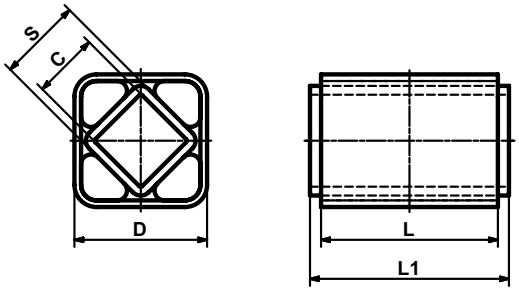


DR-A				DR-C							
Art. No.	Type	øA +0.5 0	B	Art. No.	Type	øA	□D	□S	L	L1 ±0.2	Weight [kg]
01 011 001	DR-A 15x 25			01 031 010	DR-C 15x 25				25	30	0.06
01 011 002	DR-A 15x 40	5	10 ±0.2	01 031 011	DR-C 15x 40	10 +0.4 +0.2	27 +0.4 0	15	40	45	0.10
01 011 003	DR-A 15x 60			01 031 012	DR-C 15x 60				60	65	0.15
01 011 004	DR-A 18x 30			01 031 001	DR-C 18x 30				30	35	0.10
01 011 005	DR-A 18x 50	6	12 ±0.3	01 031 002	DR-C 18x 50	13 0 −0.2	32 +0.3 −0.1	18	50	55	0.16
01 011 006	DR-A 18x 80			01 031 003	DR-C 18x 80				80	85	0.25
01 011 007	DR-A 27x 40			01 031 004	DR-C 27x 40				40	45	0.25
01 011 008	DR-A 27x 60	8	20 ±0.4	01 031 005	DR-C 27x 60	16 +0.5 +0.3	45 +0.4 0	27	60	65	0.36
01 011 009	DR-A 27x100			01 031 006	DR-C 27x100				100	105	0.60
01 011 010	DR-A 38x 60			01 031 007	DR-C 38x 60				60	70	0.60
01 011 011	DR-A 38x 80	10	25 ±0.4	01 031 008	DR-C 38x 80	20 +0.5 +0.2	60 +0.3 −0.2	38	80	90	0.79
01 011 012	DR-A 38x120			01 031 009	DR-C 38x120				120	130	1.16
new 01 011 023	DR-A 45x 80			new 01 031 023	DR-C 45x 80				80	90	1.25
new 01 011 024	DR-A 45x100	12	35 ±0.5	new 01 031 024	DR-C 45x100	24 +0.5 +0.2	75 +0.3 −0.2	45	100	110	1.53
new 01 011 025	DR-A 45x150								150	160	2.30
new 01 011 026	DR-A 50x120			new 01 031 025	DR-C 50x120				120	130	2.07
new 01 011 027	DR-A 50x200	M12x40	40 ±0.5	new 01 031 026	DR-C 50x200	30 +0.5 +0.2	80 +0.3 −0.2	50	200	210	3.45
new 01 011 028	DR-A 50x300								300	310	5.15

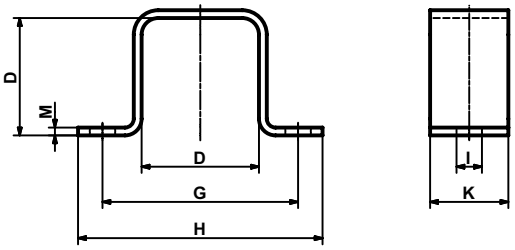
List of torque and loads on page 1.5.
Further information to customized elements and installation examples as from page 1.14.

Rubber Suspension Units

Type DR-S



Accessory Bracket BR



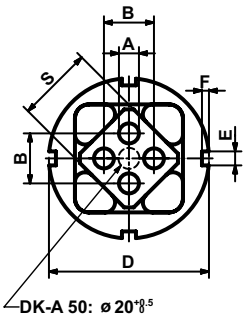
DR-S							
Art. No.	Type	□C	□D	□S	L	L1 ±0.2	Weight [kg]
01 021 001	DR-S 11x 20	8 $^{+0.25}_{0}$	20 $^{+0.3}_{-0.1}$	11	20	25	0.04
01 021 002	DR-S 11x 30				30	35	0.05
01 021 003	DR-S 11x 50				50	55	0.08
01 021 004	DR-S 15x 25	11 $^{+0.25}_{0}$	27 $^{+0.4}_{0}$	15	25	30	0.07
01 021 005	DR-S 15x 40				40	45	0.12
01 021 006	DR-S 15x 60				60	65	0.18
01 021 007	DR-S 18x 30	12 $^{+0.25}_{0}$	32 $^{+0.3}_{-0.1}$	18	30	35	0.12
01 021 008	DR-S 18x 50				50	55	0.20
01 021 009	DR-S 18x 80				80	85	0.32
01 021 010	DR-S 27x 40	22 $^{+0.25}_{0}$	45 $^{+0.4}_{0}$	27	40	45	0.26
01 021 011	DR-S 27x 60				60	65	0.39
01 021 012	DR-S 27x100				100	105	0.65
01 021 013	DR-S 38x 60	30 $^{+0.25}_{0}$	60 $^{+0.3}_{-0.2}$	38	60	70	0.67
01 021 014	DR-S 38x 80				80	90	0.90
01 021 015	DR-S 38x120				120	130	1.32
new 01 021 026	DR-S 45x 80	35 $^{+0.4}_{0}$	75 $^{+0.3}_{-0.2}$	45	80	90	1.42
new 01 021 027	DR-S 45x100				100	110	1.76
new 01 021 028	DR-S 45x150				150	160	2.62
new 01 021 029	DR-S 50x120	40 $^{+0.4}_{0}$	80 $^{+0.3}_{-0.2}$	50	120	130	2.37
new 01 021 030	DR-S 50x200				200	210	3.91
new 01 021 031	DR-S 50x300				300	310	5.80

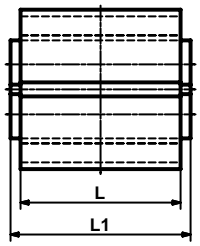
Bracket BR								
Art. No.	Type	D	G	H	øI	K	M	Weight [kg]
01 500 001	BR 11	20	37	50	6	20	2	0.03
01 500 002	BR 15	27	50	65	7	25	2	0.04
01 500 003	BR 18	32	60	80	9	30	2.5	0.08
01 500 004	BR 27	45	80	105	11	35	3	0.15
01 500 005	BR 38	60	100	125	13	40	4	0.27
new 01 500 026	BR 45	75	120	150	13	45	5	0.48
new 01 500 027	BR 50	80	135	175	18	50	6	0.71

List of torque and loads on page 1.5.
Further information to customized elements and installation examples as from page 1.14.

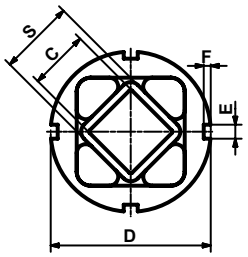
Rubber Suspension Units

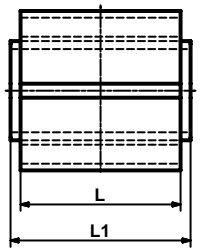
Type DK-A





Type DK-S



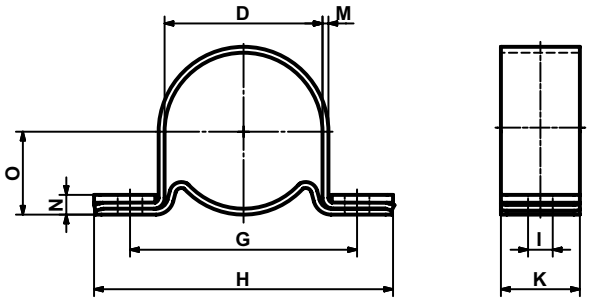


DK-A					DK-S									
Art. No.	Type	øA +0.5 0	B	Weight [kg]	Art. No.	Type	□C	Weight [kg]	øD	E	F	□S	L	L1 ±0.2
					01 081 001	DK-S 11x 20	8 +0.25 0	0.03	28 +0.5 +0.1	4	2.5	11	20	25
					01 081 002	DK-S 11x 30		0.05					30	35
					01 081 003	DK-S 11x 50		0.07					50	55
01 071 001	DK-A 15x 25	5	10 ±0.2	0.05	01 081 004	DK-S 15x 25	11 +0.25 0	0.06	36 +0.5 +0.1	5	2.5	15	25	30
01 071 002	DK-A 15x 40			0.08	01 081 005	DK-S 15x 40		0.10					40	45
01 071 003	DK-A 15x 60			0.12	01 081 006	DK-S 15x 60		0.14					60	65
01 071 004	DK-A 18x 30	6	12 ±0.3	0.10	01 081 007	DK-S 18x 30	12 +0.25 0	0.13	45 +0.6 +0.1	5	2.5	18	30	35
01 071 005	DK-A 18x 50			0.16	01 081 008	DK-S 18x 50		0.20					50	55
01 071 006	DK-A 18x 80			0.26	01 081 009	DK-S 18x 80		0.33					80	85
01 071 007	DK-A 27x 40	8	20 ±0.4	0.25	01 081 010	DK-S 27x 40	22 +0.25 0	0.27	62 +0.7 +0.1	6	3	27	40	45
01 071 008	DK-A 27x 60			0.37	01 081 011	DK-S 27x 60		0.40					60	65
01 071 009	DK-A 27x100			0.62	01 081 012	DK-S 27x100		0.66					100	105
01 071 010	DK-A 38x 60	10	25 ±0.4	0.63	01 081 013	DK-S 38x 60	30 +0.25 0	0.72	80 +0.8 +0.1	7	3.5	38	60	70
01 071 011	DK-A 38x 80			0.83	01 081 014	DK-S 38x 80		0.94					80	90
01 071 012	DK-A 38x120			1.22	01 081 015	DK-S 38x120		1.37					120	130
01 071 013	DK-A 45x 80	12	35 ±0.5	1.15	01 081 016	DK-S 45x 80	35 +0.4 0	1.35	95 +1.0 +0.1	8	4	45	80	90
01 071 014	DK-A 45x100			1.44	01 081 017	DK-S 45x100		1.65					100	110
01 071 015	DK-A 45x150			2.12	01 081 018	DK-S 45x150		2.44					150	160
01 071 016	DK-A 50x120	M12x40	40 ±0.5	2.35	01 081 019	DK-S 50x120	40 +0.4 0	2.55	108 +1.2 +0.1	8	4	50	120	130
01 071 017	DK-A 50x200			3.75	01 081 020	DK-S 50x200		4.21					200	210
01 071 018	DK-A 50x300			5.60	01 081 021	DK-S 50x300		6.45					300	310

List of torque and loads on page 1.5.
Further information to customized elements and installation examples as from page 1.14.

Rubber Suspension Units

Accessory Bracket BK



Bracket BK		D	G	H	ø I	K	M	N	O	Weight [kg]
Art. No.	Type									
01 520 001	BK 11	28	45	60	6.5	20	1.5	6	15.5	0.04
01 520 002	BK 15	36	55	75	6.5	25	2	7	20.0	0.09
01 520 003	BK 18	45	68	90	8.5	30	2	8	24.5	0.14
01 520 004	BK 27	62	92	125	10.5	35	2.5	10	33.5	0.29
01 520 005	BK 38	80	115	150	12.5	40	3	11	43.0	0.45
01 520 006	BK 45	95	130	165	12.5	45	4	14	51.5	0.74
01 520 007	BK 50	108	152	195	16.5	50	4	15	58.0	0.93

With the use of the BK bracket the working position of the DK element can be selected in the full angle-range of 360°.

Example of an individually adjustable pressure-roll on the material feeding device of a profile cutting machine, equipped with DK-A rubber suspension and BK bracket.

Example of an element connection in series (±60° element torsion) as strong wind swivel mount for solar panels, consisting of a series connection DW-C and DK-C elements with BK bracket.

List of torque and loads on page 1.5.
Further information to customized elements and installation examples as from page 1.14.

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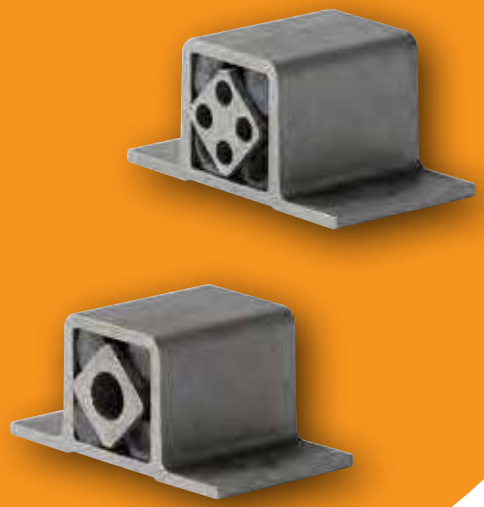
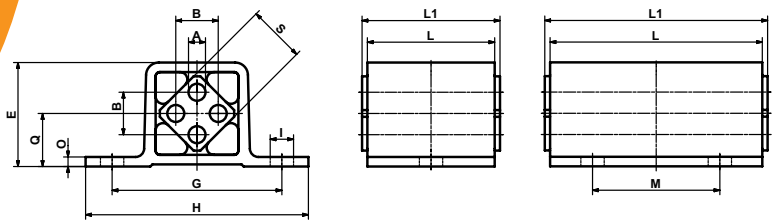
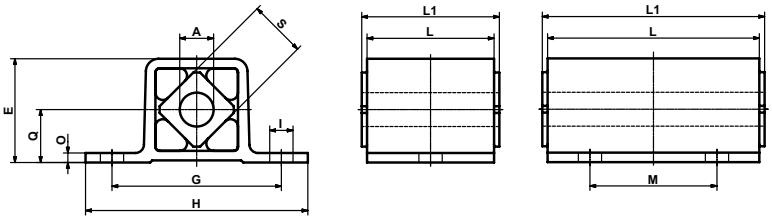


Rubber Suspension Units

Type DW-A 15 to 38



Type DW-C 15 to 38

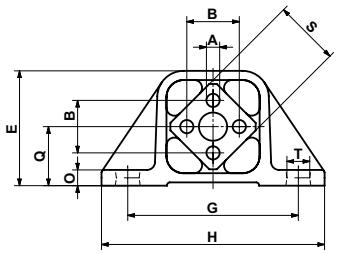


DW-A 15 to 38				DW-C 15 to 38													Weight
Art. No.	Type	øA $^{+0.5}_{0}$	B	Art. No.	Type	øA	E	G	H	øI	O	Q	□S	L	L1 $^{0}_{-0.3}$	M	[kg]
01 101 016	DW-A 15x 25			01 121 101	DW-C 15x 25									25	30	-	0.05
01 101 017	DW-A 15x 40	5	10 ±0.2	01 121 102	DW-C 15x 40	10 $^{+0.4}_{+0.2}$	29	50	65	7	3	15	15	40	45	-	0.07
01 101 018	DW-A 15x 60			01 121 103	DW-C 15x 60									60	65	40	0.11
01 101 019	DW-A 18x 30			01 121 104	DW-C 18x 30									30	35	-	0.08
01 101 020	DW-A 18x 50	6	12 ±0.3	01 121 105	DW-C 18x 50	13 $^{0}_{-0.2}$	35	60	80	9	3.5	18	18	50	55	-	0.13
01 101 021	DW-A 18x 80			01 121 106	DW-C 18x 80									80	85	50	0.21
01 101 022	DW-A 27x 40			01 121 107	DW-C 27x 40									40	45	-	0.21
01 101 023	DW-A 27x 60	8	20 ±0.4	01 121 108	DW-C 27x 60	16 $^{+0.5}_{+0.3}$	49	80	105	11	4.5	25	27	60	65	-	0.31
01 101 024	DW-A 27x100			01 121 109	DW-C 27x100									100	105	60	0.52
01 101 025	DW-A 38x 60			01 121 110	DW-C 38x 60									60	70	-	0.59
01 101 026	DW-A 38x 80	10	25 ±0.4	01 121 111	DW-C 38x 80	20 $^{+0.5}_{+0.2}$	67	100	125	13	6	34	38	80	90	40	0.77
01 101 027	DW-A 38x120			01 121 112	DW-C 38x120									120	130	80	1.15

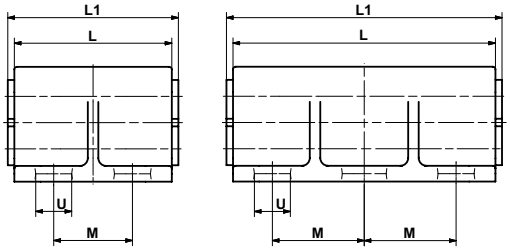
List of torque and loads on page 1.5.
Further information to customized elements and installation examples as from page 1.14.

Rubber Suspension Units

Type DW-A 45 and 50

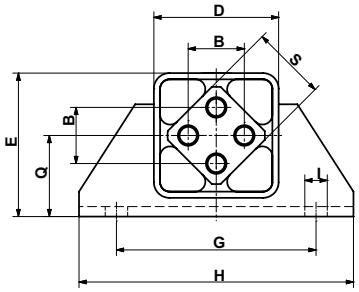


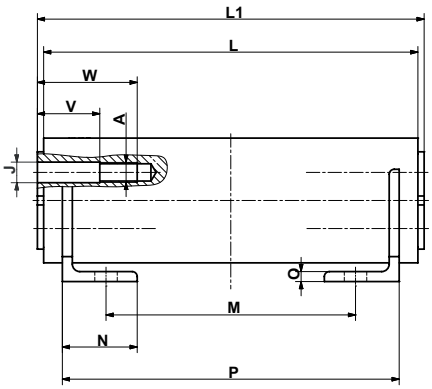
DW-A 50x200



DW-A 45 and 50															
Art. No.	Type	A	B ±0.5	E	G	H	O	Q	□S	T	U	L	L1 ±0.2	M	Weight [kg]
01 101 015	DW-A 45x100	ø12 +0.5 0	35	80	115	145	8	41	45	13	20	100	110	65	2.9
01 101 013	DW-A 50x120											120	130	60	3.7
01 101 028	DW-A 50x160	M12x40	40	88	130	170	12	45	50	17	27	160	170	70	5.0
01 101 014	DW-A 50x200											200	210	70	6.1

Type DW-A 60 to 100



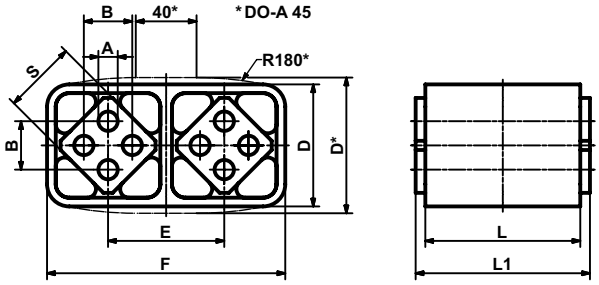


DW-A 60 to 100																			
Art. No.	Type	A	B	D	E	G	H	øI	øJ	N	O	Q	□S	V	W	L	L1 ±0.2	M	P	Weight [kg]
new 01 101 031	DW-A 60x150													40	70	150	160	60	130	8.9
new 01 101 032	DW-A 60x200	M16	45	100	115	160	220	18	16.5	60	8	65	60	50	80	200	210	100	170	11.1
new 01 101 033	DW-A 60x300													50	80	300	310	200	270	15.9
new 01 101 034	DW-A 70x200															200	210	100	170	15.4
new 01 101 035	DW-A 70x300	M20	50	120	140	200	260	22	20.5	65	9	80	70	50	90	300	310	200	270	21.7
new 01 101 036	DW-A 70x400															400	410	300	370	28.2
new 01 101 037	DW-A 80x200															200	210	80	170	21.7
new 01 101 038	DW-A 80x300	M20	60	136	153	220	280	22	20.5	80	10	85	80	50	90	300	310	180	270	30.4
new 01 101 039	DW-A 80x400															400	410	280	370	39.4
new 01 101 040	DW-A 100x250															250	260	110	220	43.8
new 01 101 041	DW-A 100x400	M24	75	170	195	300	380	26	25	100	12	110	100	50	100	400	410	260	370	64.7
new 01 101 042	DW-A 100x500															500	510	360	470	78.7

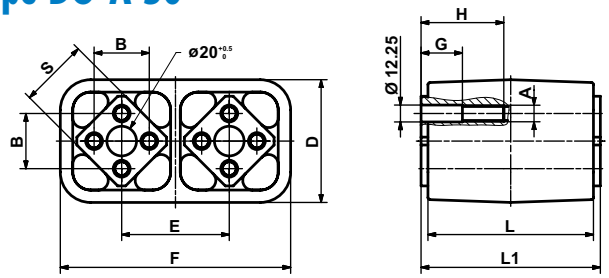
List of torque and loads on page 1.5.
Further information to customized elements and installation examples as from page 1.14.

Rubber Suspension Units

Type DO-A 15 to 45



Type DO-A 50



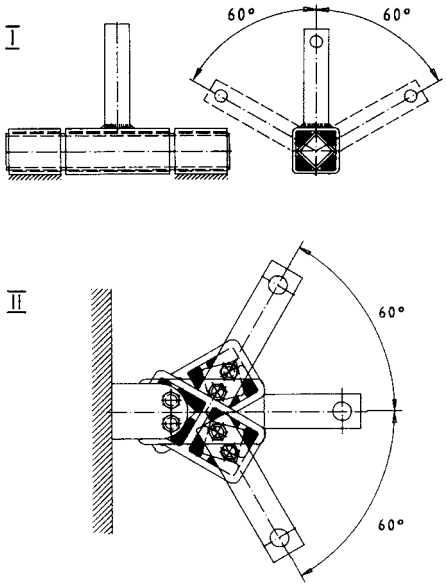
DO-A												Weight
Art. No.	Type	øA +0.5 0	B	D	E	F	□S	G	H	L	L1 ±0.2	[kg]
01 041 001	DO-A 15x 25									25	30	0.07
01 041 002	DO-A 15x 40	5	10 ±0.2	28 ±0.15	25.5	53.5 ±0.2	15	-	-	40	45	0.10
01 041 003	DO-A 15x 60									60	65	0.15
01 041 004	DO-A 18x 30									30	35	0.12
01 041 005	DO-A 18x 50	6	12 ±0.3	34 ±0.15	31	65 ±0.2	18	-	-	50	55	0.20
01 041 006	DO-A 18x 80									80	85	0.30
01 041 007	DO-A 27x 40									40	45	0.32
01 041 008	DO-A 27x 60	8	20 ±0.4	47 ±0.15	44	91 ±0.2	27	-	-	60	65	0.47
01 041 009	DO-A 27x100									100	105	0.78
01 041 010	DO-A 38x 60									60	70	0.87
01 041 011	DO-A 38x 80	10	25 ±0.4	63 ±0.2	60	123 ±0.3	38	-	-	80	90	1.15
01 041 012	DO-A 38x120									120	130	1.68
01 041 013	DO-A 45x 80									80	90	1.85
01 041 014	DO-A 45x100	12	35 ±0.5	85 ±0.5	73	150 ±1	45	-	-	100	110	2.25
01 041 015	DO-A 45x150									150	160	3.35
01 041 016	DO-A 50x120							30	60	120	130	5.50
01 041 019	DO-A 50x160	M12	40 ±0.5	ca. 89	78	ca. 168	50	30	60	160	170	7.40
01 041 017	DO-A 50x200							40	70	200	210	8.50

List of torque and loads on page 1.5.
Further information to customized elements and installation examples as from page 1.14.

Rubber Suspension Units

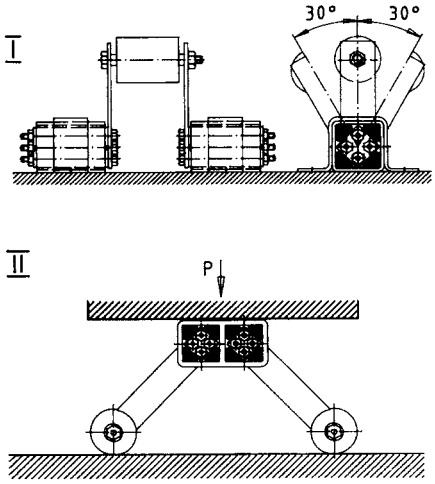
Serial Connection

Doubled oscillating angle
(±60°) at constant torque of a single unit.

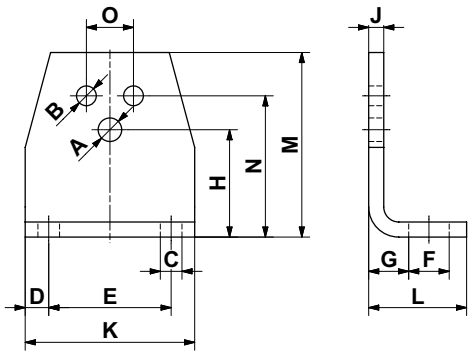


Parallel Connection

Doubled torque momentum
at constant oscillating angle (±30°).



Accessory Bracket WS



Bracket WS		Fit for tensioner devices			Fit for DR-A, DK-A, DW-A													Weight
Art. No.	Type	SE size	øA	H	Element size	øB	N	O	C	D	E	F	G	J	K	L	M	[kg]
06 590 001	WS 11–15	11	6.5	27	15	5.5	35	10	7	7.5	30	13	11.5	4	45	30	46	0.08
06 590 002	WS 15–18	15	8.5	34	18	6.5	44	12	7	7.5	40	13	13.5	5	55	32	58	0.15
06 590 003	WS 18–27	18	10.5	43	27	8.5	55	20	9.5	10	50	15.5	16.5	6	70	38	74	0.28
06 590 004	WS 27–38	27	12.5	57	38	10.5	75	25	11.5	12.5	65	21.5	21	8	90	52	98	0.70
06 590 005	WS 38–45	38	16.5	66	45	12.5	85	35	14	15	80	24	21	8	110	55	116	0.90
06 590 006	WS 45–50	45	20.5	80	50	12.5	110	40	18	20	100	30	26	10	140	66	140	1.80

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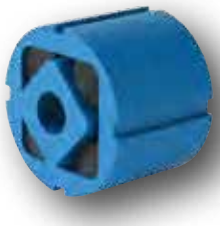
ROSTA Rubber Suspension Units

Short delivery time for the following special elements:

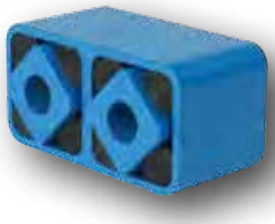


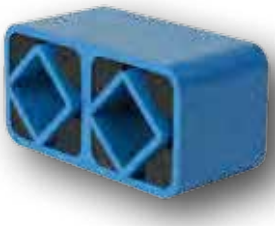
- Delivery summary for ROSTA rubber qualities

Rubber quality	Factor in relation to the list "torque and loads" (page 1.5)	Working temperature	Rubber	Specification
Rubmix 10	**1.0**	–40 ° to +80 °C	NR	– Standard quality
Rubmix 20	**approx. 1.0**	–30 ° to +90 °C	CR	– Good oil-resistance – Elements marked with yellow dot
Rubmix 40	**approx. 0.6**	from +80 ° to +120 °C	EPDM-Silicone	– High temperature resistance – Elements marked with red dot
Rubmix 50	**approx. 3.0**	–35 ° to +90 °C	PUR	– Max. oscillation angle ±20° – Limited oscillation frequencies – No permanent water contact – Elements marked with green dot

- Elements with different length of housings and/or inner squares.

- DW light metal profiles with customized bores in the flange plates (quantity and position).
- Element with threaded bores in inner square: selectable for A or C inner squares, or full steel profile with required bores.
- Elements **DK-C**, **DO-C**, **DW-C**, **DW-S** and **DO-S** (see page 1.4):





Not all sizes are available in all combinations.
Please contact ROSTA.

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Zinc-plated double element structure
brush suspension in car wash site

Customized laser parts on housing
front wheel suspension for wheelchair

Customized nodular cast housing
swivel-mount for ripper comb in shredder

60° series connection (cast housings)
hinge bearing for truck engine hood

Cataphoretic housing protection, "Rubmix 40" inserts
marker light suspension for truck trailers

60° series connection (light metal profiles)
hinge bearing for glass shelf-cover

Stainless precision casting, machined core
swivel-mount for machine cover

Welded structure, "Rubmix 50" inserts
hinge for wheelchair-ramp on busses

Today, about 50% of all supplied rubber suspension elements are fully customized parts. With pleasure we do await your project definition for the development of an ingenious and cost-saving rubber suspension, fitting your specific requirements.

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ROSTA Rubber Suspension Units

Examples of fixations to Housing

Fig. 1 Square tubular housing with bracket BR

Fig. 2 Round housing with bracket BK

Fig. 3 Outer housing in clamping jaw

Fig. 4 Double bracket welded on housing

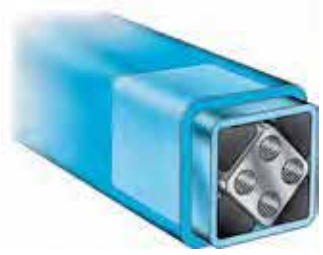

Fig. 5 Plug-in connection

Fig. 6 Dual-threaded plate welded on housing

Fig. 7 Dual-levers welded on housing

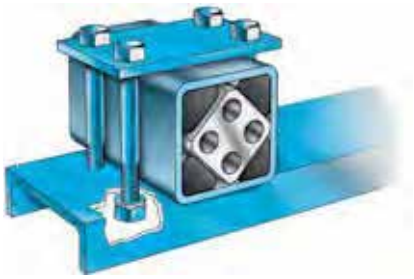

Fig. 8 Bridge-clamp over housing

Fig. 9 Flange welded on housing

Fig. 10 Housing in cast iron

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Examples of fixations to Inner Square Section

Fig. 11 Inner square section with four through bores and bracket UV

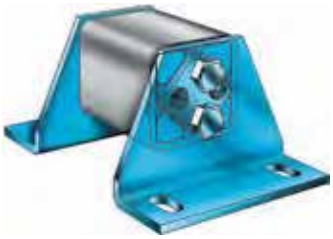

Fig. 12 Inner square section with four through bores and brackets

Fig. 13 Plug-in connection with lever and welded-on square steel piece

Fig. 14 Lever connection with one through bolt

Fig. 15 Inner square section made of solid metal and machined threads on both sides

Fig. 16 Inner square section made of solid metal and cross bores on both protruding sides

Fig. 17 Inner square section with four through bores and bolted-on lever

Fig. 18 Inner square section made of solid steel and welded-on bracket

Fig. 19 Inner square section with a central through bore

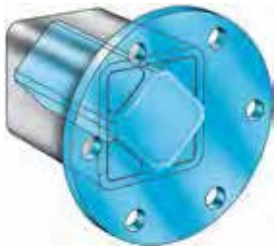

Fig. 20 Inner square section made of solid steel and welded-on flange

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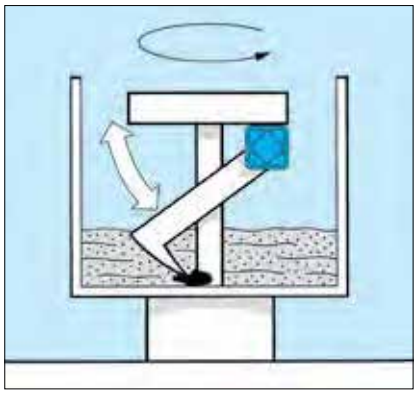
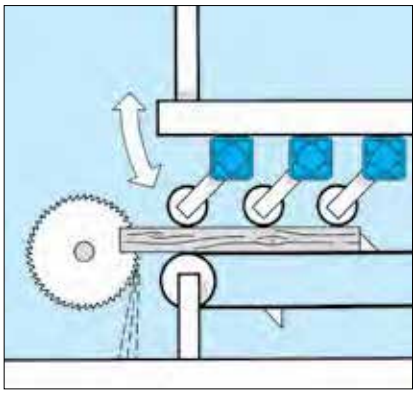
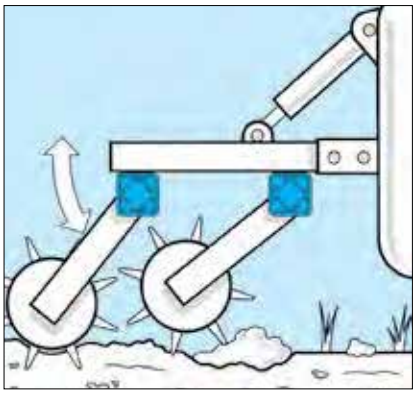
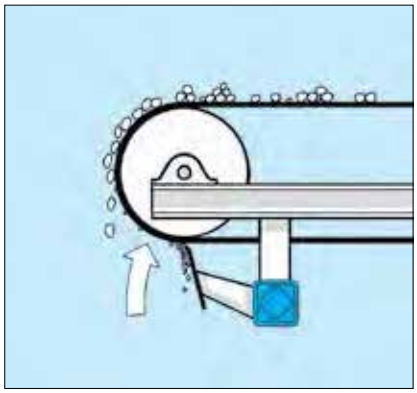
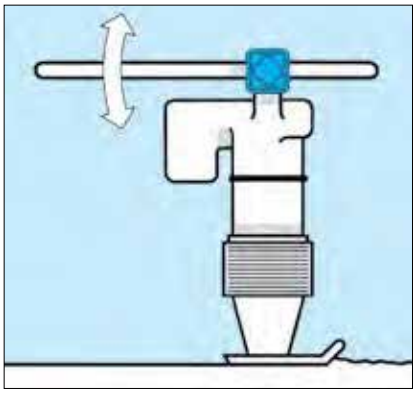
Installation Examples

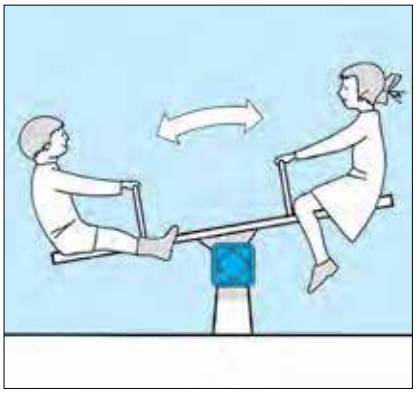

Lever bearing in concrete mixer

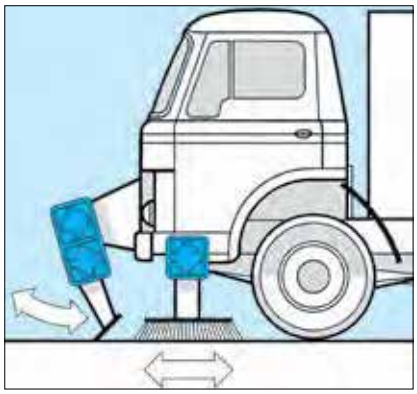

Pressure rollers in saw device

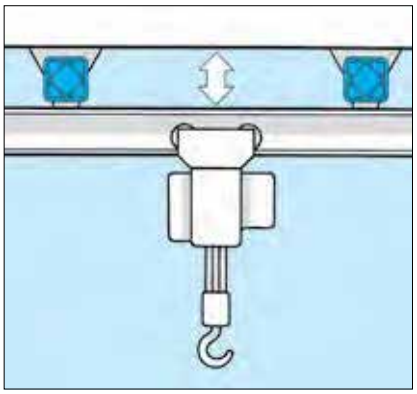

Pendulum on harrow rollers

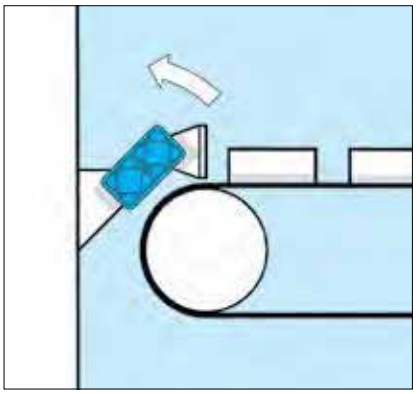

Conveyor-belt scraper

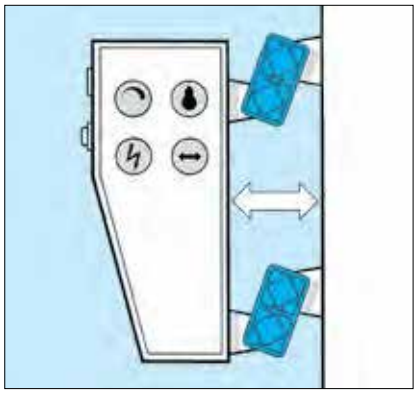

Handle-bar insulation

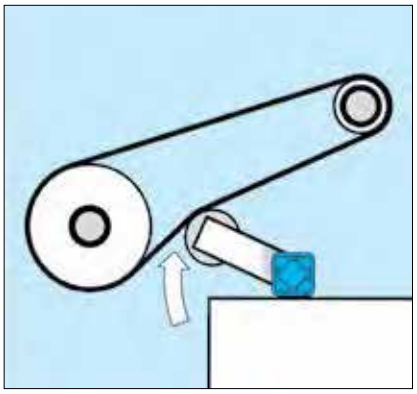

See-saw support

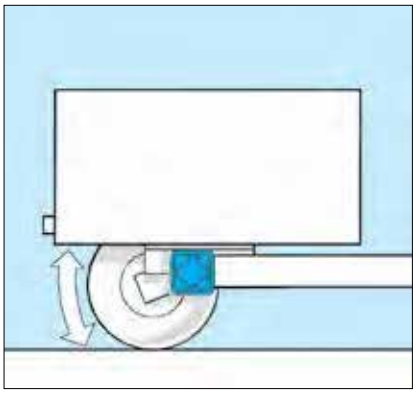

Elastical brush and scraper suspension


Suspended crane rail


Shock absorber


Control unit insulation


Chain and belt tensioner


Independent wheel suspension

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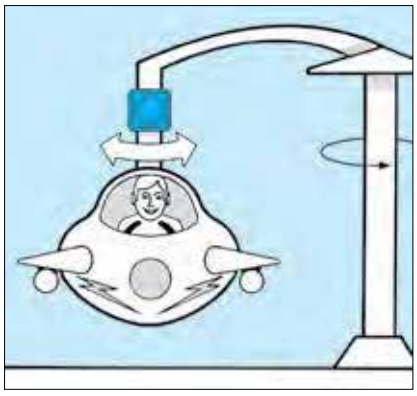
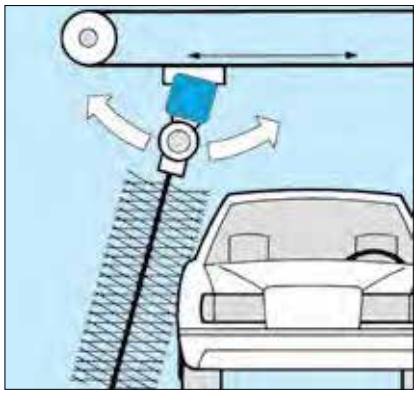
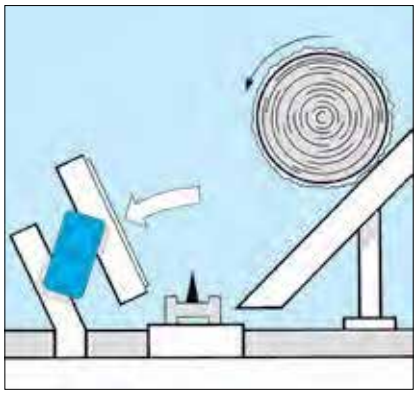
Installation Examples



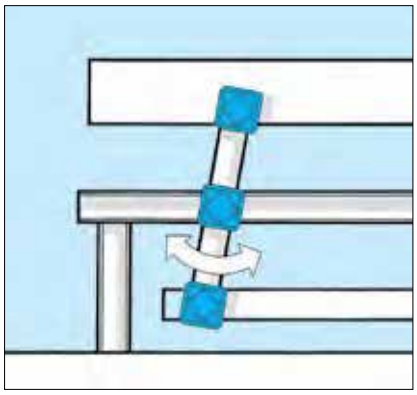
Pendulum on amusement ride



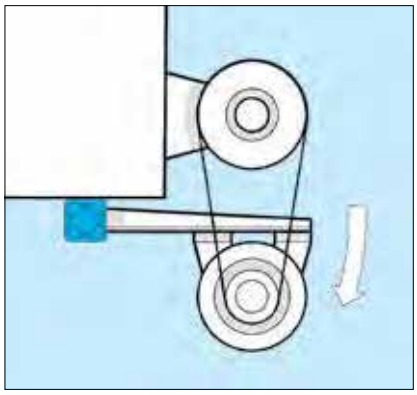
Compensation bearing for car brush



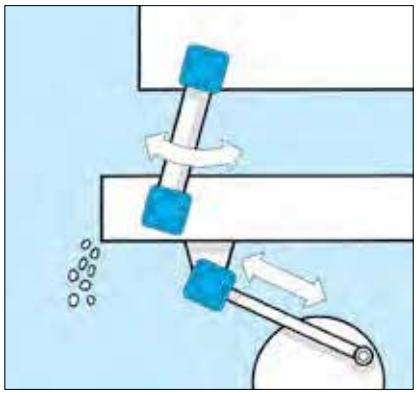
Impact suspension in feeder



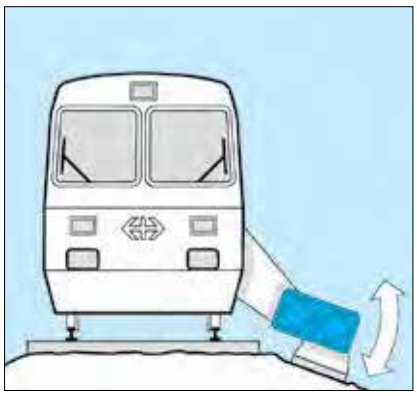
Double suspension



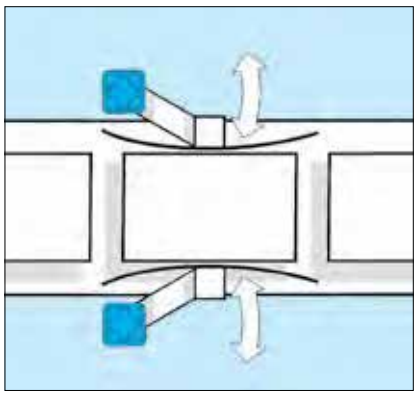
Motorbase



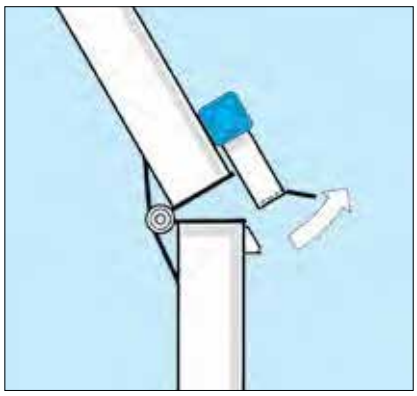
Shaker conveyor



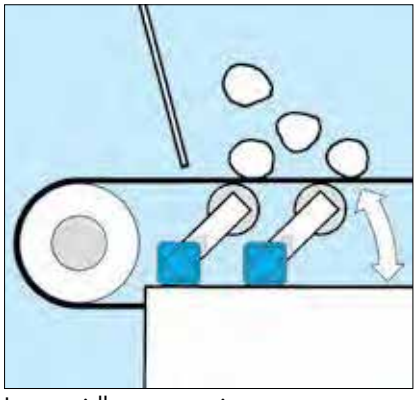
Compactor-suspension



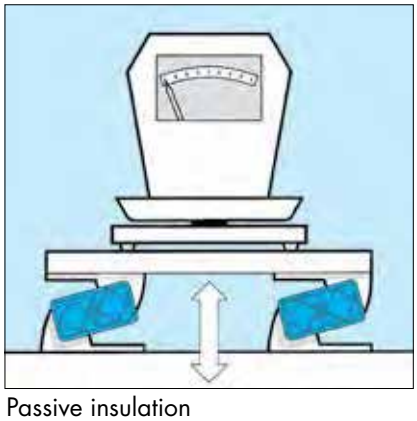
Guide rail



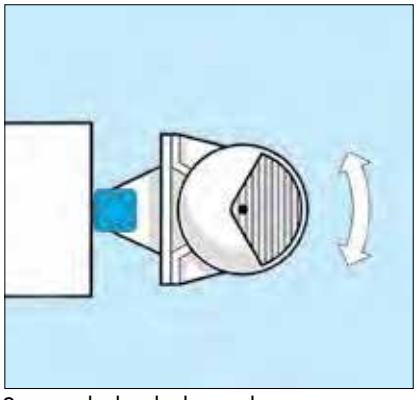
Suspended pawl



Impact-idler suspension



Passive insulation



Suspended unbalanced motor

Applications!

Examples:

ROSTA AG
CH-5502 Hunzenschwil
Phone +41 62 889 04 00
Fax +41 62 889 04 99
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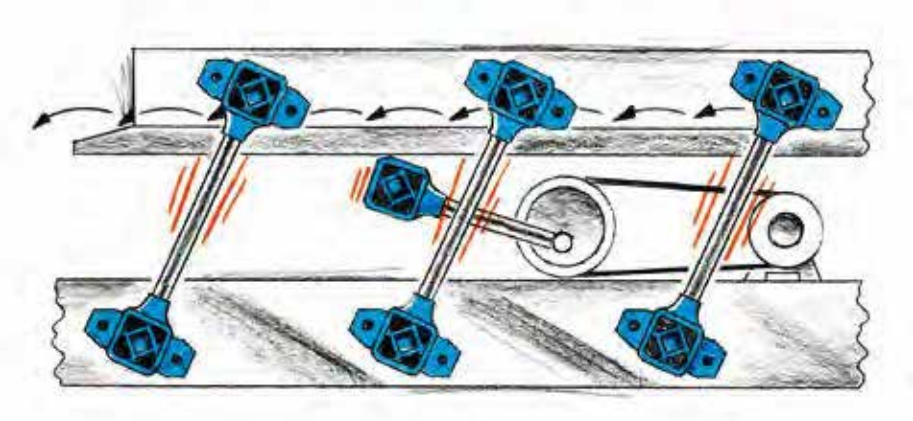
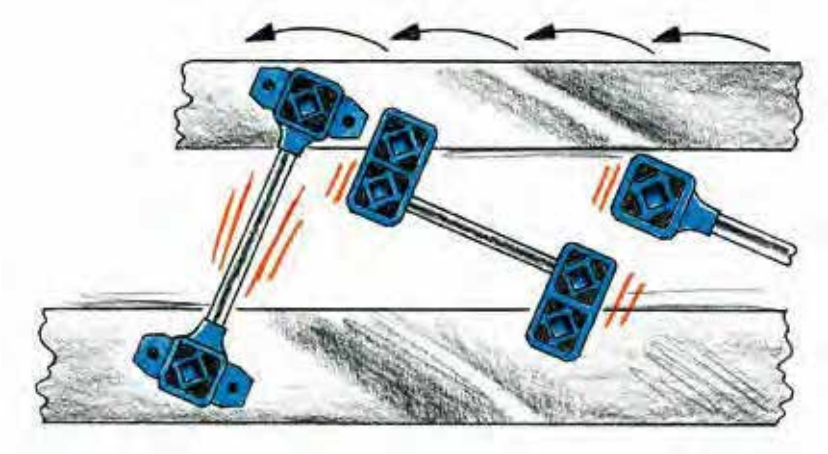
ROSTA Oscillating

elastic suspensions for all types of screening



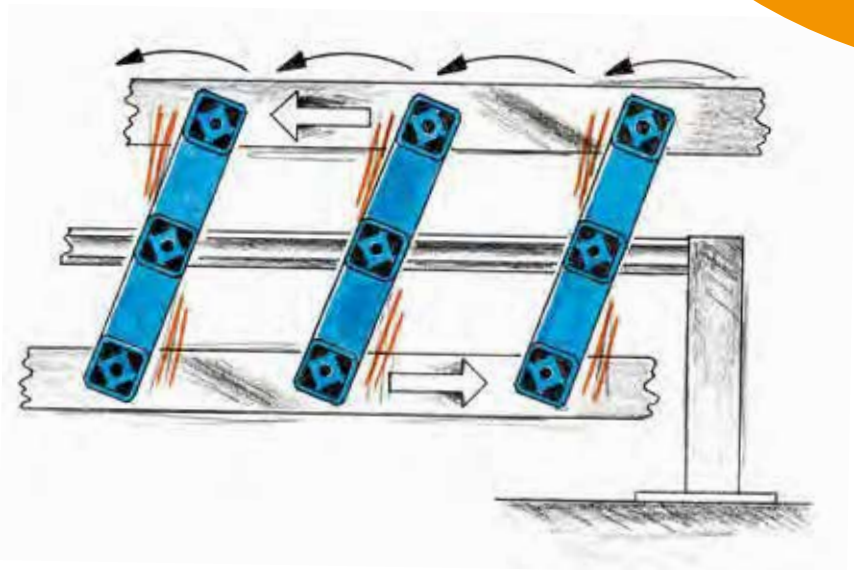
Rocker arms and drive heads for crank shaft driven shaker conveyors
- **maintenance-free and long lasting guide arms for shakers**
- **resilient rod heads for alternating loads**

AU Rocker Arm



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**



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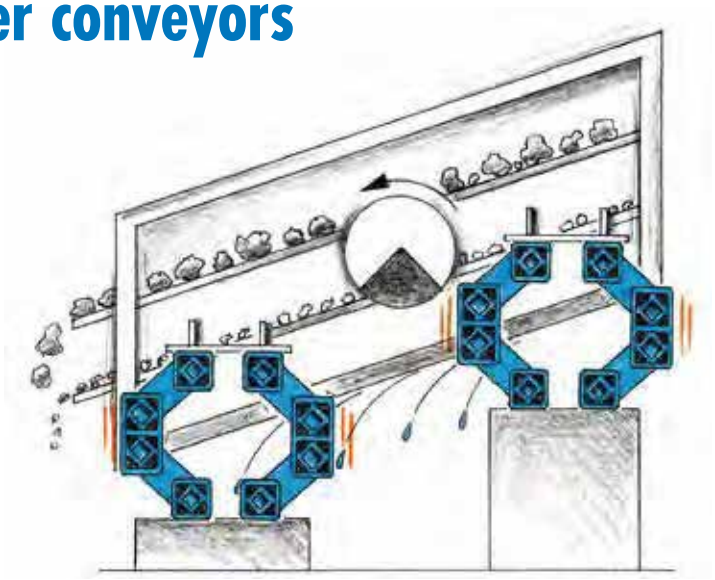
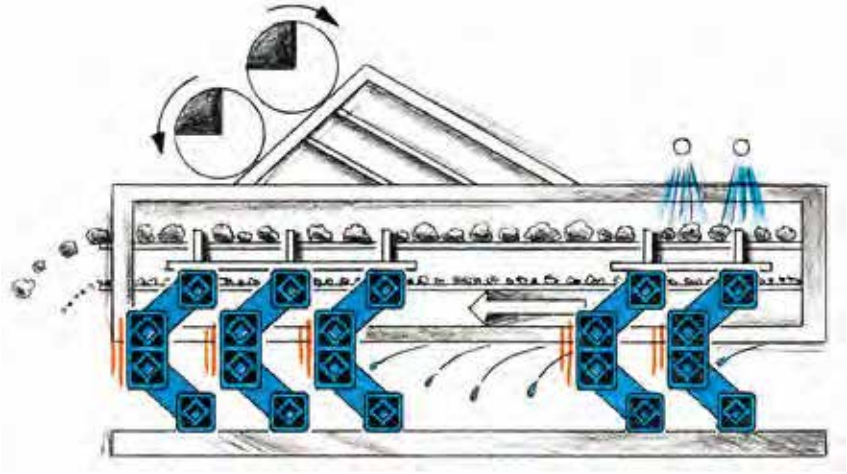
Mountings
machines and shaker conveyors



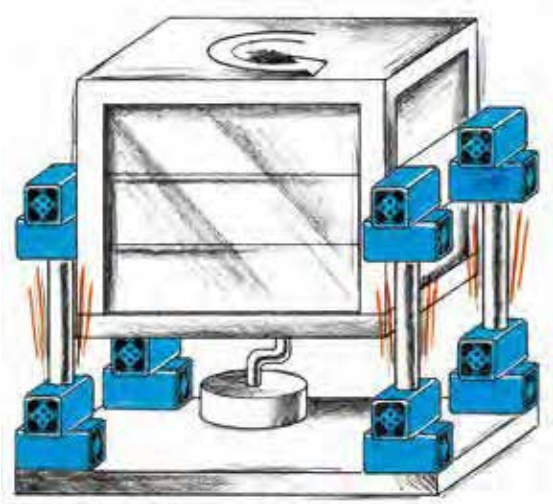
Vibration absorbing mounts for circular and linear motion screens
- long lasting
- high isolation degree
- corrosion-resistant
- overload-proof

AB Screen Mount

AK Universal Joint



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



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

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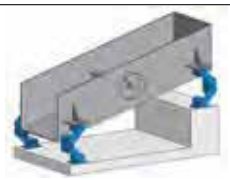
Selection table for free oscillating systems (with unbalanced excitation)

		 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.			
	**AB-D** Page 2.13		**Oscillating Mounting** 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.		
	**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

			Gyratory sifter upright staying	Gyratory sifter hanging
	**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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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		
Single Rocker with adjustable length. Models with right-hand and left-hand threads. 7 sizes up to 5'000 N per rocker suspension.			**AU** Page 2.25	
Single Rocker with decided center distance. 6 sizes up to 2'500 N for flange fixation. 6 sizes up to 2'500 N for central fixation.			**AS-P** **AS-C** Page 2.26	
		Double Rocker with decided center distance. 5 sizes up to 2'500 N for flange fixation. 4 sizes up to 1'600 N for central fixation.	**AD-P** **AD-C** Page 2.27	
Single rocker and **double rocker** 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.			**AR** Page 2.28	
Drive Head 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.			**ST** Page 2.29	
	Spring Accumulator 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.		**DO-A** Page 2.30	

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

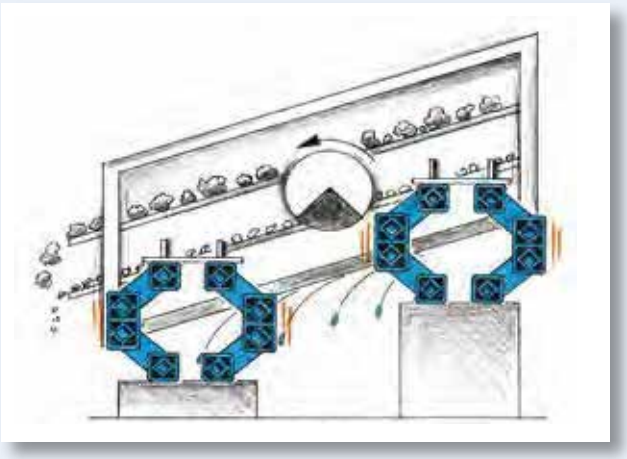
Introduction

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.

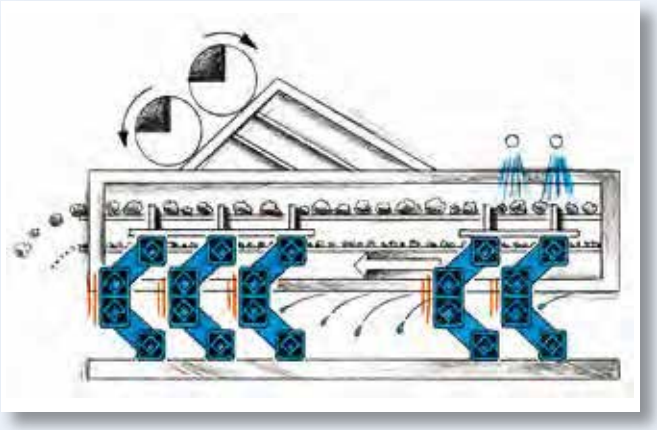
Circular motion screens



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° to 30°, 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



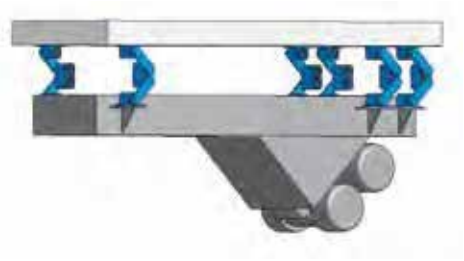
Linear motion screens or linear vibrators are normally excited by two unbalanced motors or by means of linear exciters, as well as through double unbalanced shafts (Eliptex), which generate a linear or slightly elliptical oscillation of the screening frame. Depending on the inclination positioning of 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

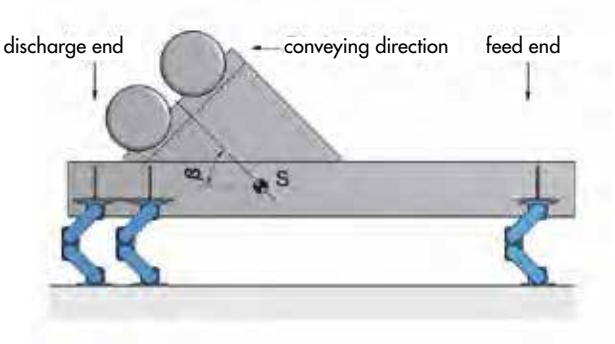


Discharge chutes under silos are normally supported by means of complicated yoke constructions and are suspended on pressure springs. With its HS suspensions (HS = hanging screen), ROSTA offers the possibility of the direct, cost-effective suspension of the discharge unit on silos and bunkers. The geometry 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^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 · g	4.0	g
• Natural frequency suspensions	**fe**	**2.7**	**Hz**
Degree of isolation	W	97	%



Calculation formulas

Loading per corner

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

Oscillating stroke (Amplitude peak to peak)

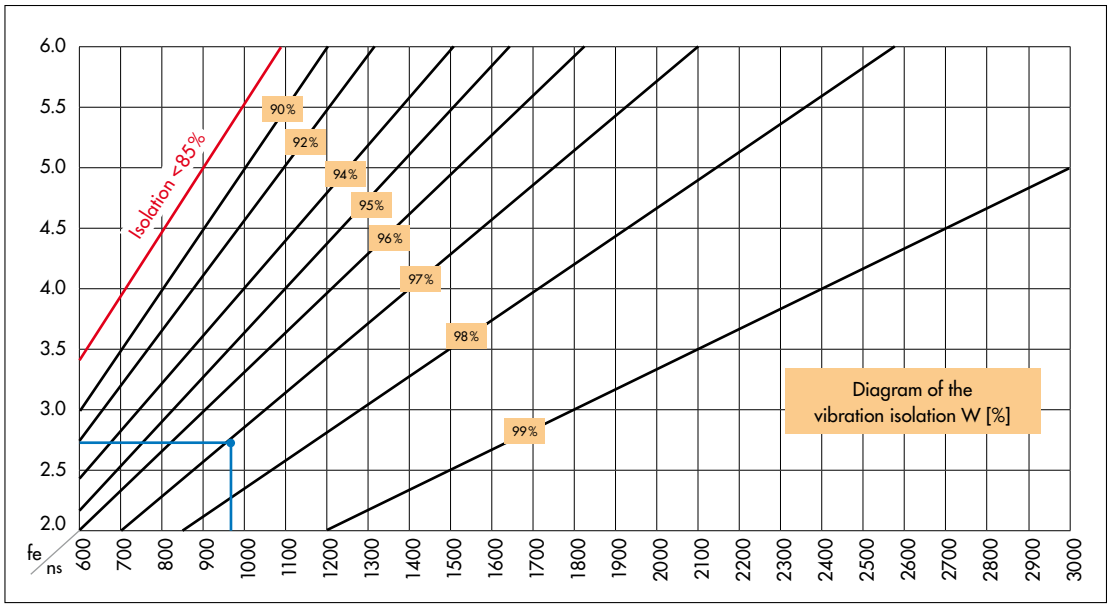
$$sw_0 = \frac{AM}{m_0} \cdot 10 \qquad sw = \frac{AM}{m} \cdot 10 \quad [mm]$$

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

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

• 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)

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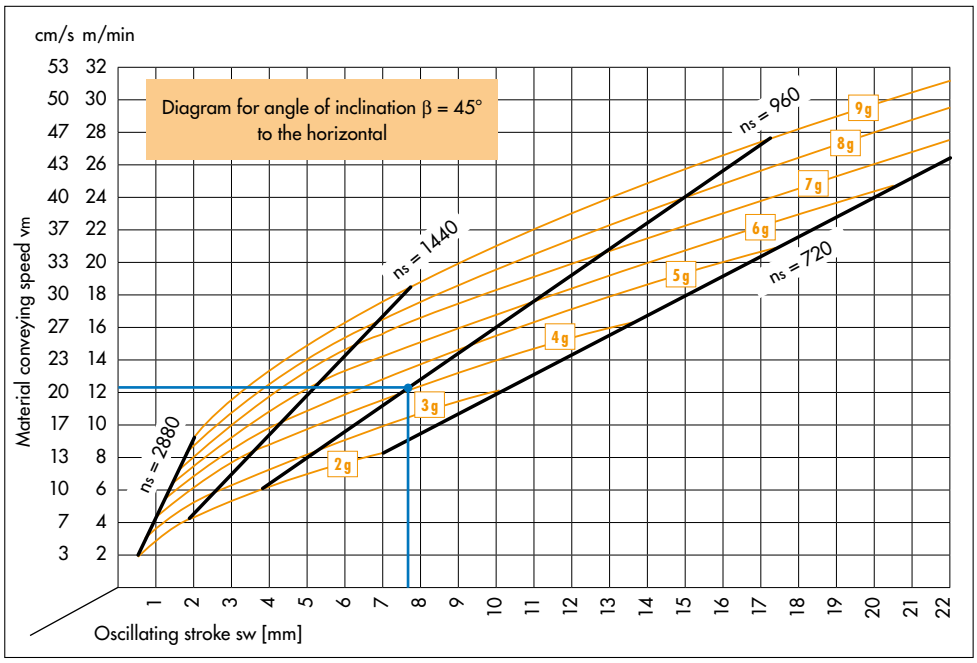
Technology

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.

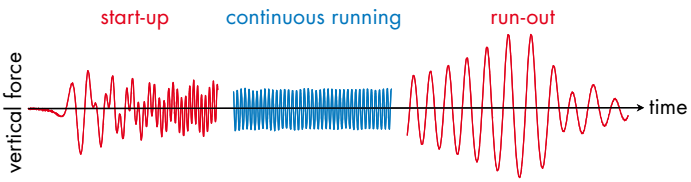
- **Example:**

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

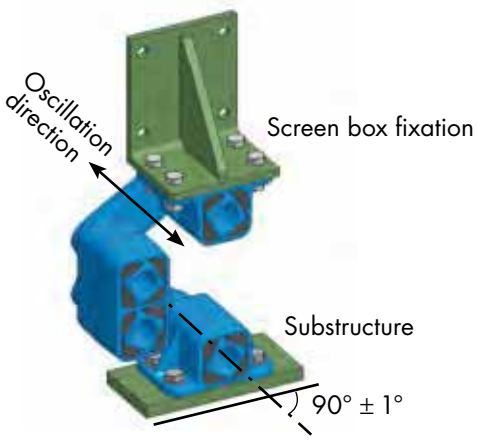
At the screen start-up and run-out the suspension elements are passing through the resonance frequency. By the resulting amplitude superelevation the four rubber suspensions in the AB mountings do generate a high level of damping which is absorbing the remaining energy after only a few strokes. The screen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

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

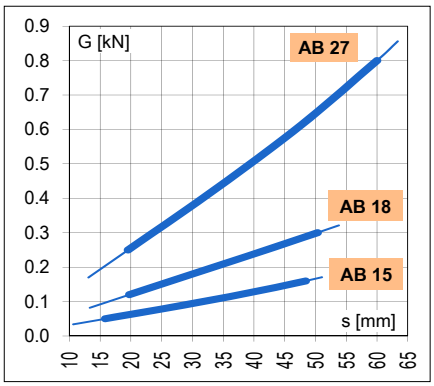


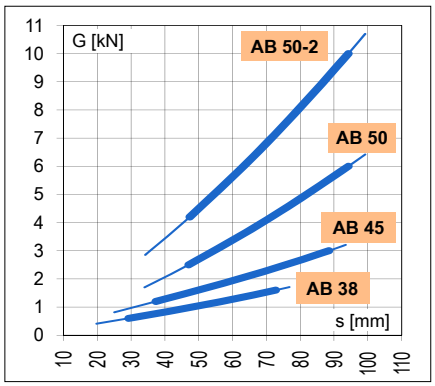
Alignment of the elements

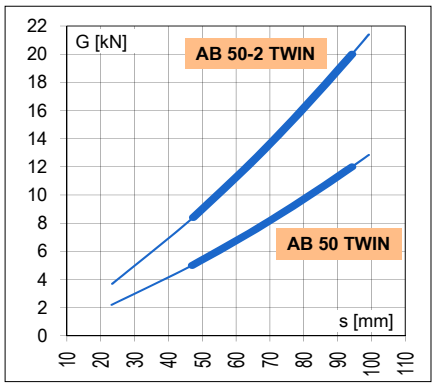
If the suspensions for linear motion screens are arranged as shown on page 2.7, a harmonic, noiseless oscillation of the screen will result. The rocker arm fixed to the screen carries out the greater part of the oscillations. The rocker arm fixed to the substructure remains virtually stationary and ensures 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







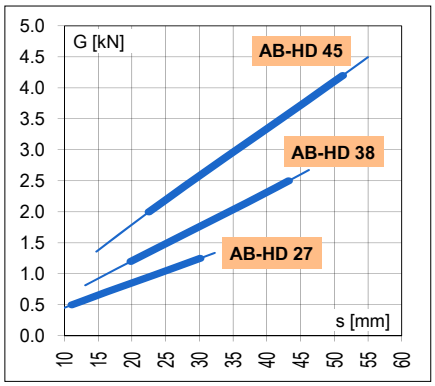
Deflection curves and cold flow behaviours

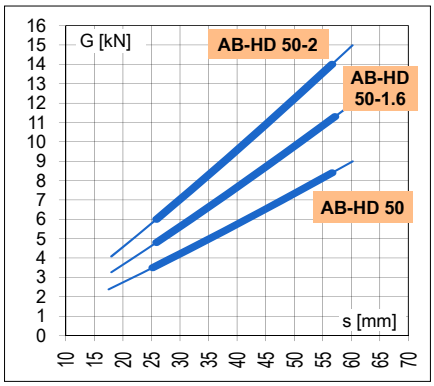
Diagrams showing the vertical deflection **s** (in mm) by compression or tensile load **G** (in kN). The shown values comprehend the **initial cold flow settling** after one day of operation. The final element deflection after the full cold flow compensation (after approx. 1 year) is usually factor x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

Final element deflection = s x 1,09

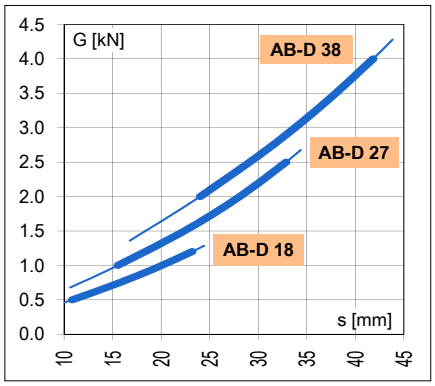
The deflection values are based on our catalogue specifications and should be understood as approximate values. Please consult also our tolerance specifications in chapter "Technology" in the general catalogue.

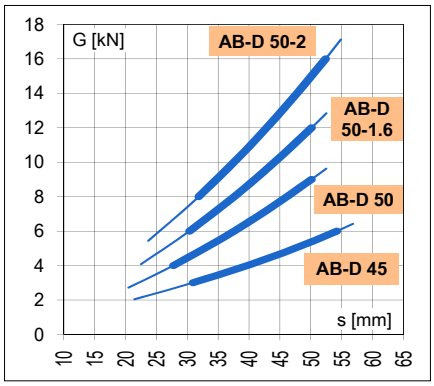
Compression load AB-HD



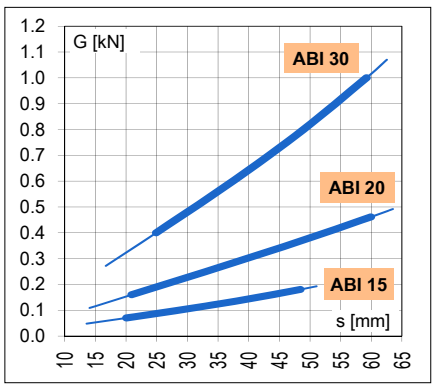


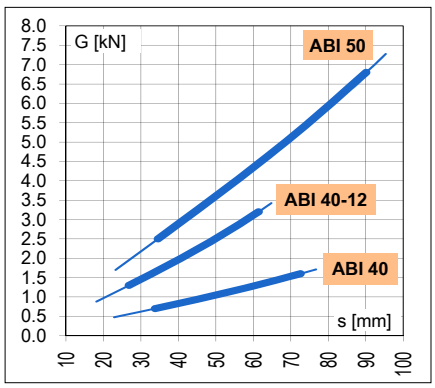
Compression load AB-D

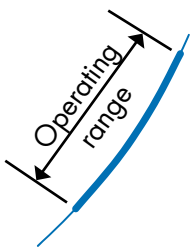




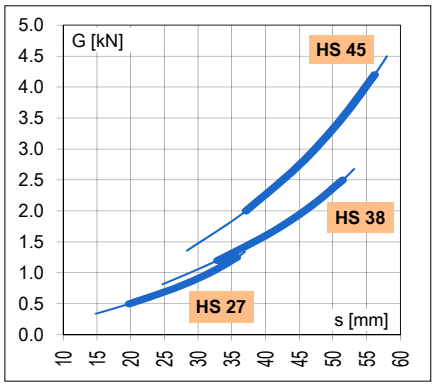
Compression load ABI

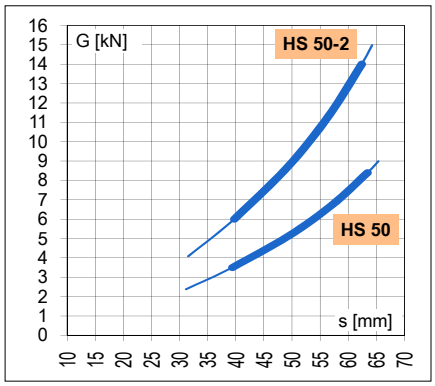






Tensile load HS





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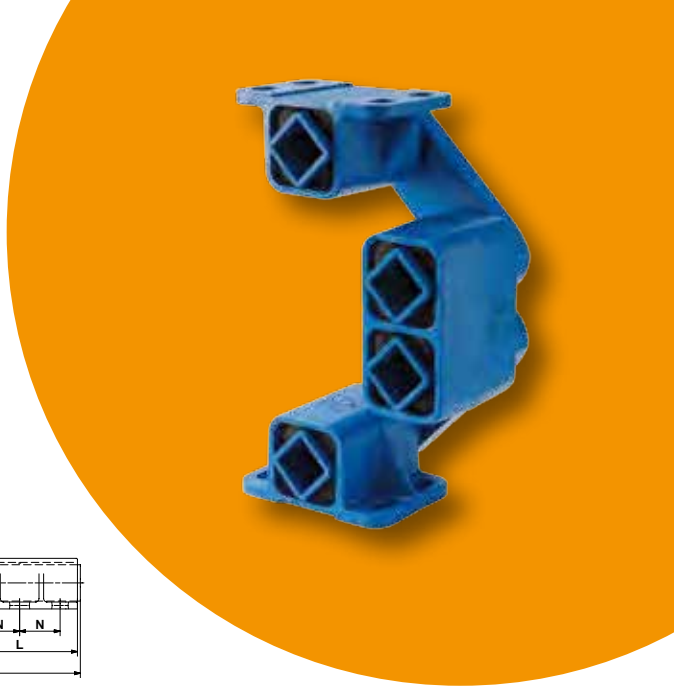
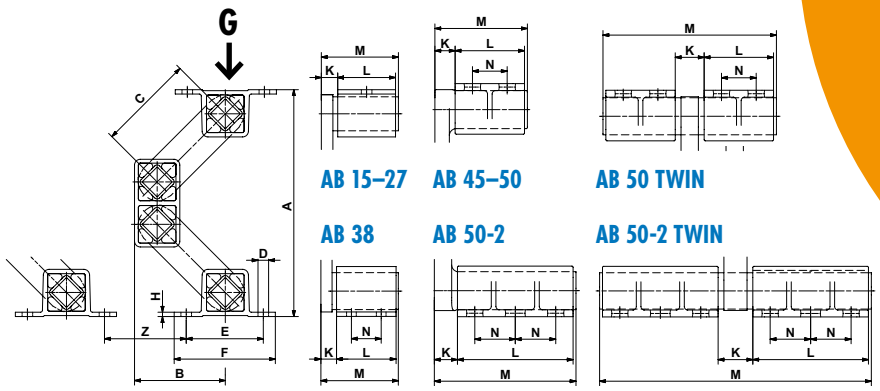
Oscillating Mountings

Type AB

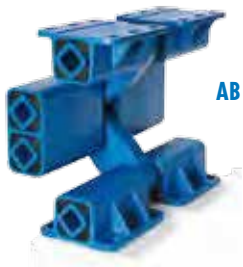




Art. No.	Type	Load capacity Gmin.–Gmax. [N]	A un-loaded	A* max. load	B un-loaded	B* max. load	C	D	E	F	H	K	L	M	N	Weight [kg]
07 051 056	AB 15	50 – 160	169	115	71	89	80	ø7	50	65	3	10	40	52	–	0.5
07 051 057	AB 18	120 – 300	208	154	88	107	100	ø9	60	80	3.5	14	50	67	–	1.2
07 051 058	AB 27	250 – 800	235	170	94	116	100	ø11	80	105	4.5	17	60	80	–	2.2
07 051 059	AB 38	600 – 1'600	305	225	120	147	125	ø13	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]	Dynamic spring value 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. [–]	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)



AB TWIN

* 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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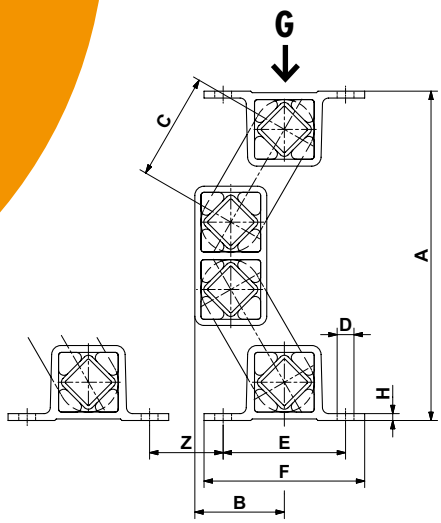
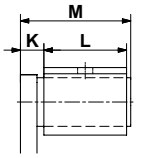
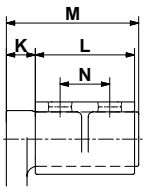
Oscillating Mountings

Type AB-HD



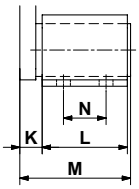


AB-HD 27

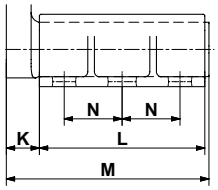


AB-HD 45 to AB-HD 50-1.6

AB-HD 38



AB-HD 50-2



Art. No.	Type	Load capacity Gmin. – Gmax. [N]	A unloaded	A* max. load	B unloaded	B* max. load	C	D	E	F	H	K	L	M	N	Weight [kg]
new 07 051 070	AB-HD 27	500 – 1'250	215	182	59	78	70	ø11	80	105	4.5	17	60	80	–	1.6
new 07 051 071	AB-HD 38	1'200 – 2'500	293	246	79	106	95	ø13	100	125	6	21	80	104	40	4.9
new 07 051 072	AB-HD 45	2'000 – 4'200	346	290	98	130	110	13x20	115	145	8	28	100	132	65	11.3
07 051 062	AB-HD 50	3'500 – 8'400	376	313	105	141	120	17x27	130	170	12	40	120	165	60	22.7
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	6'000 – 14'000	376	313	105	141	120	17x27	130	170	12	45	200	250	70	35.5

Art. No.	Type	Natural frequency Gmin. – Gmax. [Hz]	Z**	Dynamic spring value cd vertical [N/mm]	Dynamic spring value 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. [–]	Light metal profile	Steel welded construction	Nodular cast iron	ROSTA blue painted
new 07 051 070	AB-HD 27	4.8 – 3.1	70	70	33	12	3.5	10	5.2	8	9.3	x	x		x
new 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
new 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
07 051 062	AB-HD 50	3.2 – 2.4	120	270	130	18	5.2	15	7.7	8	9.3			x	x
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
07 051 060	AB-HD 50-2	3.2 – 2.4	120	450	215	18	5.2	15	7.7	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			

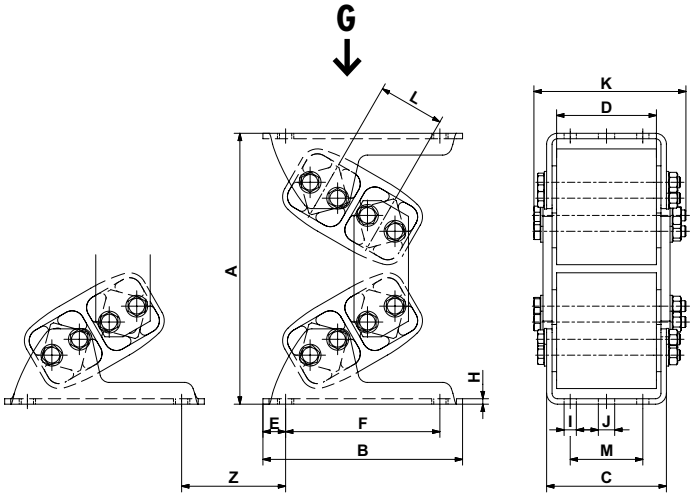
Please find elements for higher load capacities on page 2.17.

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.

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	**AB-D 18**	500 – 1'200	137	112	115	61	50	12.5	90	3	9	9	74	31	30	1.3
07 281 001	**AB-D 27**	1'000 – 2'500	184	148	150	93	80	15	120	4	9	11	116	44	50	2.9
07 281 002	**AB-D 38**	2'000 – 4'000	244	199	185	118	100	17.5	150	5	11	13.5	147	60	70	7.5
07 281 003	**AB-D 45**	3'000 – 6'000	298	240	220	132	110	25	170	6	13.5	18	168	73	80	11.5
07 281 004	**AB-D 50**	4'000 – 9'000	329	272	235	142	120	25	185	6	13.5	18	166	78	90	17.9
07 281 005	**AB-D 50-1.6**	6'000 – 12'000	329	272	235	186	160	25	185	8	13.5	18	214	78	90	24.5
07 281 006	**AB-D 50-2**	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 cd vertical [N/mm]	cd at sw [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. [–]	Light metal profile	Steel plate	Nodular cast iron	ROSTA blue painted
07 281 000	**AB-D 18**	6.1–4.4	30	100	4	20	5	1.4	5	2.6	4	4.6	x	x		x
07 281 001	**AB-D 27**	5.4–3.9	35	160	4	35	7	2.0	6	3.1	5	5.8	x	x		partial
07 281 002	**AB-D 38**	4.3–3.4	40	185	6	40	9	2.6	8	4.1	6	7.0	x	x		partial
07 281 003	**AB-D 45**	3.7–3.1	55	230	8	70	11	3.2	9	4.6	7	8.1	x	x		partial
07 281 004	**AB-D 50**	3.7–2.9	55	310	8	120	12	3.5	10	5.2	8	9.3	x	x	x	x
07 281 005	**AB-D 50-1.6**	3.6–2.9	55	430	8	160	12	3.5	10	5.2	8	9.3	x	x	x	x
07 281 006	**AB-D 50-2**	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)			

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.

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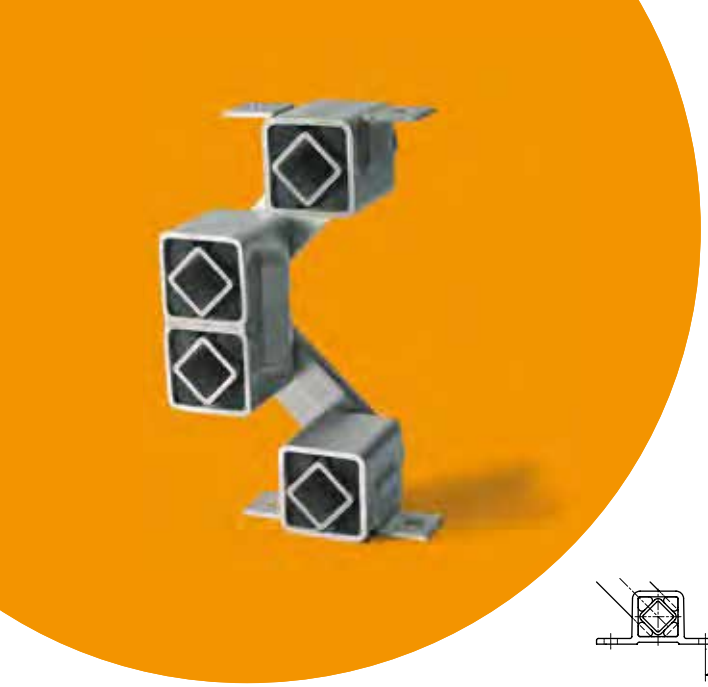
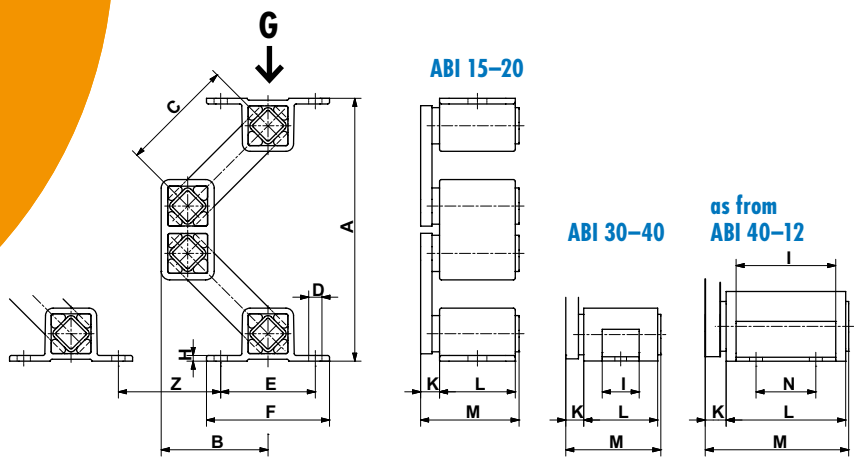


Oscillating Mountings

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	ø 11	85	110	4	35	17	70	90	–	3.3
07 171 104	**ABI 40**	700 – 1'600	317	237	128	155	125	ø 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	ø 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	ø 18	140	180	5	120	33	150	187	70	20.9

Art. No.	Type	Natural frequency Gmin. – Gmax. [Hz]	Z**	Dynamic spring value cd vertical [N/mm]	Dynamic spring value 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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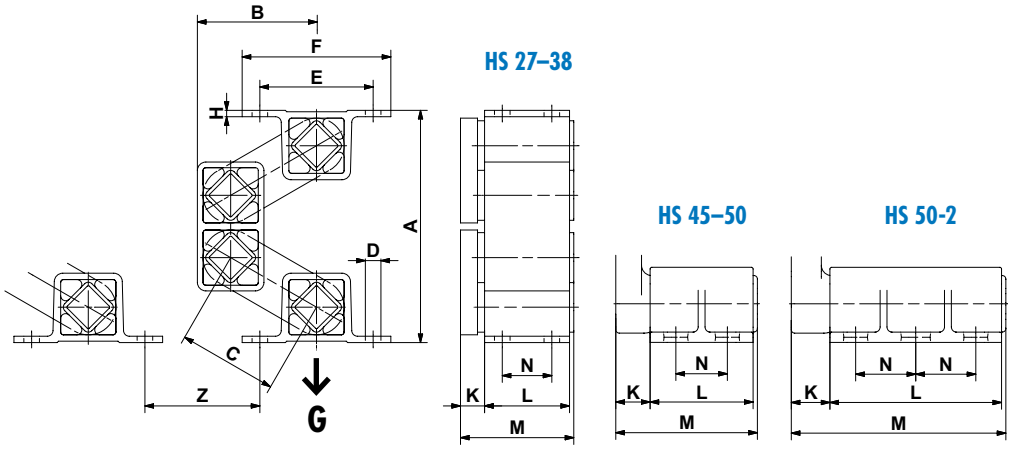
Oscillating Mountings

Type HS



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	13 x 20	115	145	8	28	100	132	65	11.3
07 311 004	HS 50	3'500 – 8'400	288	357	148	118	120	17 x 27	130	170	12	40	120	165	60	20.2
07 311 005	HS 50-2	6'000 – 14'000	288	357	148	118	120	17 x 27	130	170	12	45	200	250	70	34.0

Art. No.	Type	Natural frequency Gmin.–Gmax. [Hz]	Z**	Dynamic spring value cd vertical [N/mm]	Dynamic spring value 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. [–]	Light metal profile	Steel welded construction	Nodular cast iron	ROSTA blue painted
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	3.2–3.0	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 rpm and sw of 8 mm		Acceleration > 9.3 g is not recommended						Material structure			

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.

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

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

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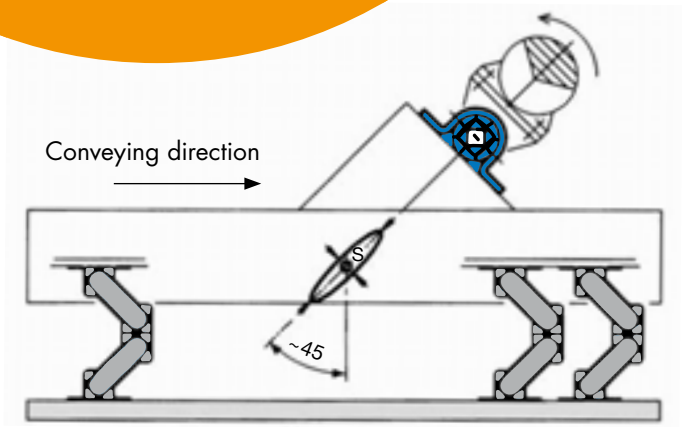
ROSTA Oscillating Mountings and Accessories for individual Customer Solutions

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”.

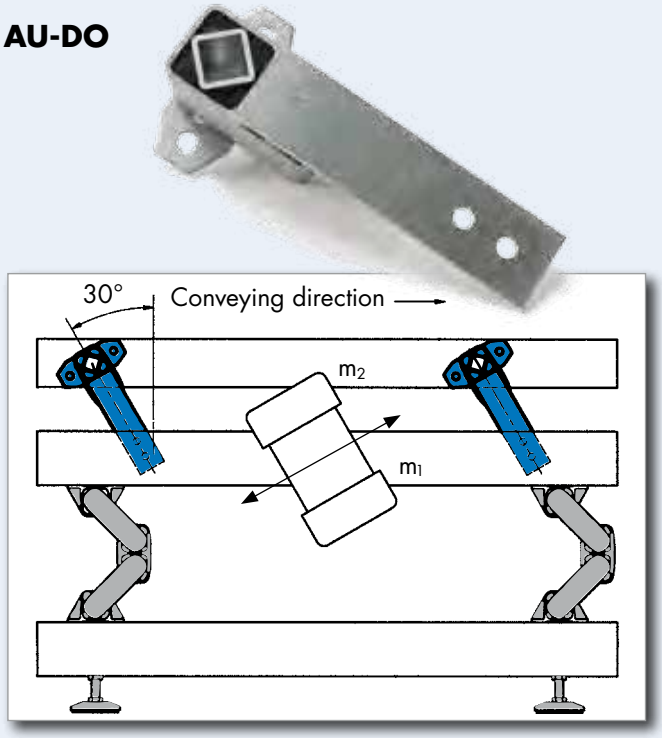
Allocation table

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

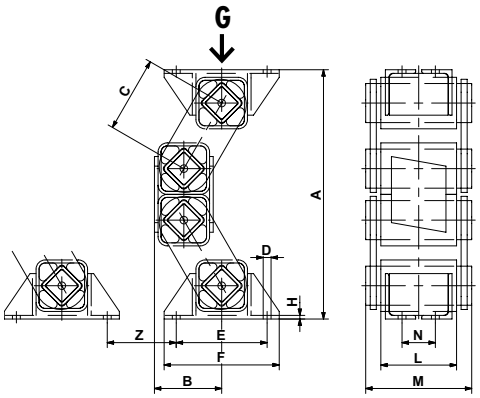
AU-DO



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	**AB-HD 70-3**	9'000 – 20'000	592	494	160	215	180	22	200	260	9	300	380	200	82
new 07 051 080	**AB-HD 100-2.5*** **	15'000 – 37'000	823	676	222	302	250	26	300	380	12	250	350	110	170
new 07 051 081	**AB-HD 100-4*** **	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 cd vertical [N/mm]	Dynamic spring value 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. [–]	Steel welded construction	ROSTA blue painted
07 051 076	**AB-HD 70-3**	2.4 – 2.1	200	670	320	25	7.3	18	9.3	8	9.3	x	x
new 07 051 080	**AB-HD 100-2.5*** **	2.4 – 1.8	250	1150	530	30	8.6	18	9.3	8	9.3	x	x
new 07 051 081	**AB-HD 100-4*** **	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 final cold flow compensation (after approx. 1 year).
** separate assembly instructions are available, please ask for details.
*** We will be glad to calculate your specific system, please ask for our relevant questionnaire.

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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 consist 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).

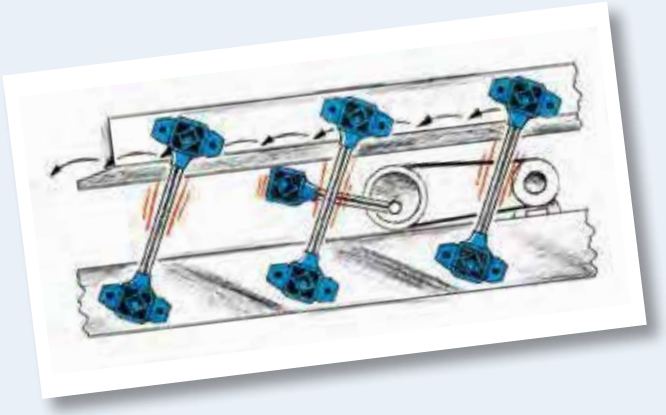
To achieve a very "smooth" course of motions on **fast** acting shaker conveyors based on one or two masses the installation of additional **spring accumulators** offering an actuation of the shaker system close by the resonance frequency ("natural frequency" systems) is recommended. These pre-loaded 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

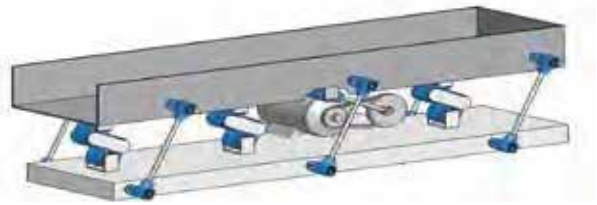
Design	Characteristics	ROSTA elements
 "brute-force" system as basic version	acceleration: **1.1 to 1.7 g-forces** conveying speed: **6 to 15 m/min** trough lengths: **max. 12 to 15 meters**	oscillating mountings: **AU, AS-P, AS-C, AR** drive heads: **ST**

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.

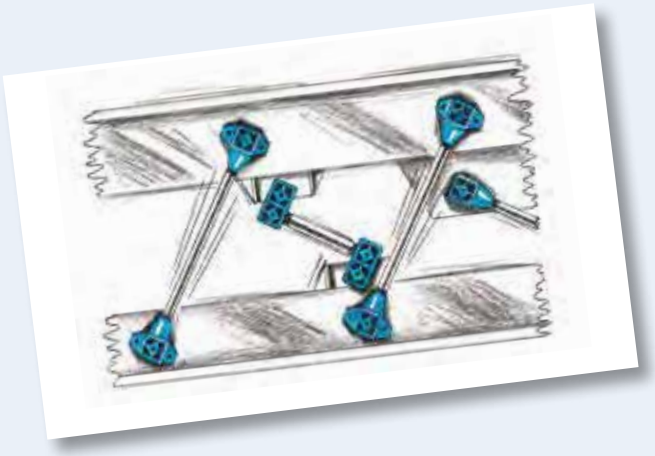
To avoid high material fatigue stress on the trough structure, the relevant design should feature heavy stiffening rips and border strips to make the feeding channel more or less "infinitely" stiff. One mass shaker conveyors have to be bolted down on the foundations by means of tie anchors.



One mass shaker conveyor systems equipped with spring accumulators

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

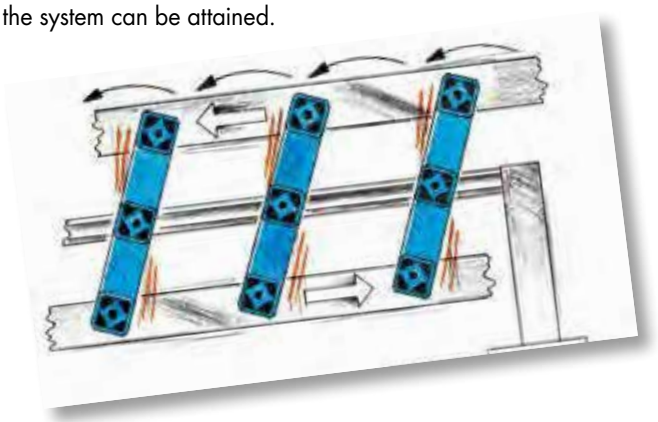
These "natural frequency" feeding system generally shows the same constructive design like the "brute-force" shaker, but is disposed with additional spring accumulator sets installed between trough structure and ground frame in order to reduce the hard hits by the change in direction of the crank shaft 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
 "fast-runner" system offering high capacities	acceleration: **1.5 to 5.0 g-forces** conveying speed: **10 to 45 m/min** trough lengths: **up to 25 meters**	oscillating mountings: **AD-P, AD-C, AR** drive heads: **ST** spring accumulators: **additional DO-A elements**

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_0	200	kg
	Weight of feeding material		50	kg
	Material coupling factor 50% *	m_m	25	kg
	Weight of oscillating mass *	$m = m_0 + m_m$	225	kg
Drive parameter	Eccentric radius	R	12	mm
	Stroke	$sw = 2 \cdot R$	24	mm
	Rpm on trough	n_s	340	min^{-1}
	Gravity acceleration	g	9.81	m/s^2
	Oscillating machine factor	K	1.6	
	Acceleration	$a = K \cdot g$	1.6	g
	Total spring value of system	c_t	285	N/mm
Rocker arms	Distance between rockers max.	L_{max}	1.5	m
	Quantity of rockers	z	6	
	Load per rocker	G	368	N
	Selection osc. elements (e. g.)		**12× AU 27**	
	Selection ROSTA-elements: AU, AR, AS-P, AS-C			
	Center distance of elements	A	200	mm
Drive	Acceleration force	F	3423	N
	Selection drive head		**1× ST 45**	
	Drive capacity approx.	P	1.0	kW
Spring value of natural frequency shaker	Dynamic torque	Md_d	2.6	Nm/°
	Dynamic spring value per rocker	c_d	7.4	N/mm
	Dynamic spring value of all rockers	$z \cdot c_d$	44.7	N/mm
	Resonant ability factor	i	0.16	

* 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

Calculation formulas

Oscillating machine factor

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

Total spring value (machine)

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

Quantity of rockers

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

Load per rocker

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

Acceleration force (ST selection)

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

Drive capacity approx.

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

Dynamic spring value per rocker

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

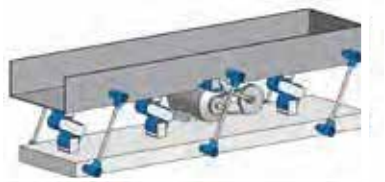
Resonant ability factor

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

By a resonant ability factor i ≥0,8 the system is usually titled “natural frequency shaker”.

2. One mass system with spring accumulators: Calculation

Calculation analog chapter 1 with following additions:



Spring accumulators	Quantity	z_s	2	
	Dynamic spring value per item	c_s	100	N/mm
	Dynamic spring value of all items	$z_s \cdot c_s$	200	N/mm
	Resonant ability factor	i_s	0.86	
	Selection of accumulators		**2x cons. of 2x DO-A 45x80**	

Resonant ability factor with accumulators

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

By a resonant ability factor i_s ≥0.8 the system is usually titled “natural frequency shaker”.

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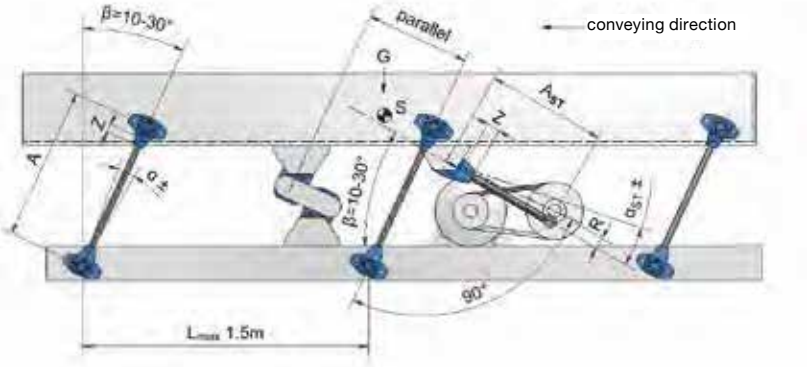
Technology

3. One mass shaker conveyor systems: Installation instructions



Distance between rockers L_{max}:
- Usually, the distance between the rocker arms on the trough alongside 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, centrical 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.

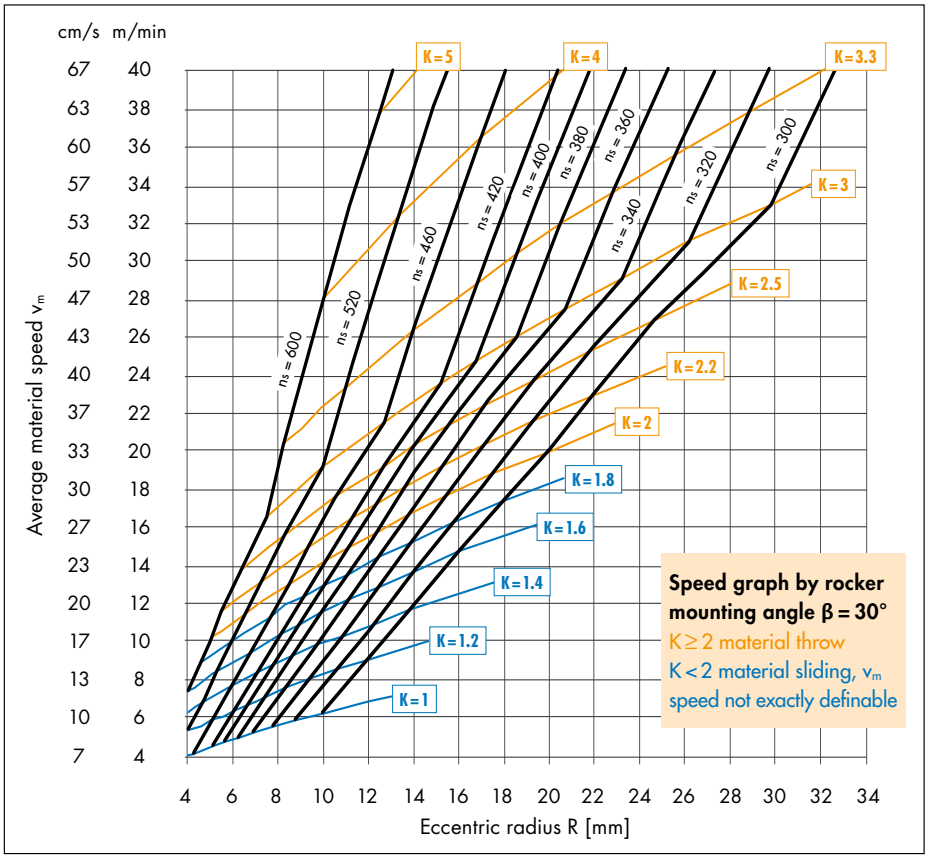
Rocker mounting angle β:
According to the relevant processing function of the shaker conveyor, the rocker arms are positioned at mounting angles between 10° to 30° in relation to the perpendicular line. (The ideal combination of fast conveying speed with high material throw is given by a rocker inclination angle of 30°.) 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 α:
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 x 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 β 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 mm** and the revolutions **n_s = 340 min^{-1}** is resulting a theoretical material speed of **v_m = 12 m/min** or **20 cm/sec.**

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

Technology

5. Maximum rocker load G, revolutions n_s and angle of oscillation α

Size (e.g. AU 15)	max. load capacity per rocker [N]				max. revolutions n_s [min^{-1}] *	
	K < 2	K = 2	K = 3	K = 4	$\alpha \pm 5°$	$\alpha \pm 6°$
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

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^{-1} and the oscillation angles max. ±6°.
* basics: "permissible frequencies" in the Technology part of the ROSTA catalogue.

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

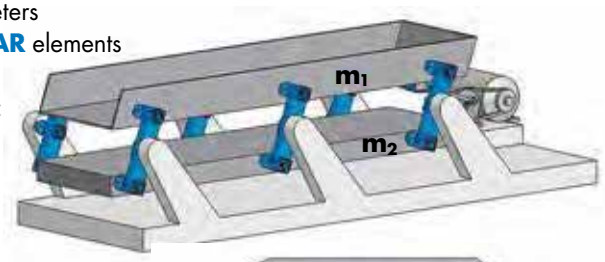
Calculation oscillation angle for rockers

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

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

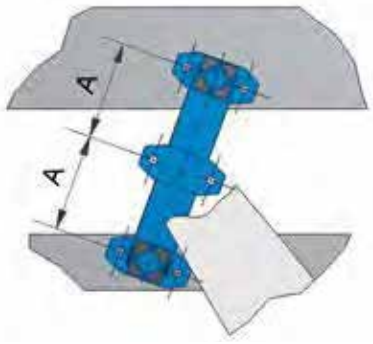
6. Two mass shaker systems with direct reaction force-compensation

- Maximum acceleration forces of approx. 5 g, shaker lengths up to 20 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

$$c_d = \frac{3 \cdot Md_d \cdot 360 \cdot 1000}{2 \cdot A^2 \cdot \pi} \text{ [N/mm]}$$



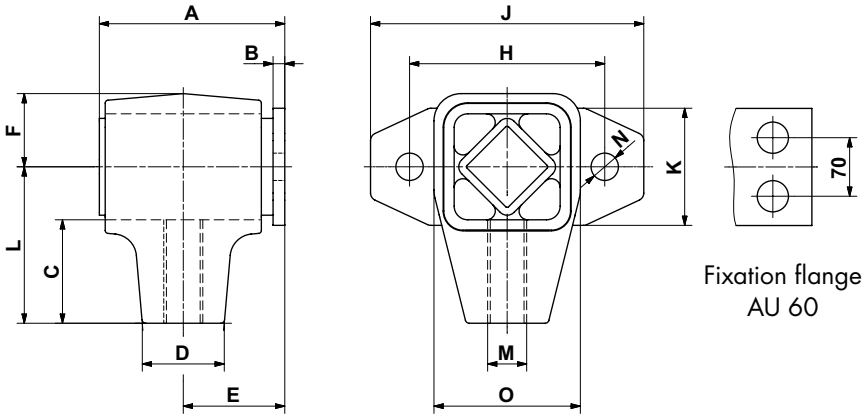
- Calculation of c_t and F based on the total mass (m_1 and m_2)
- Power input from eccentric drive with **ST arbitrary** on m_1 or m_2 at **any point** alongside m_1 or m_2
- On demand, special double rocker arms with varying center distances A are available as "customized rockers"

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



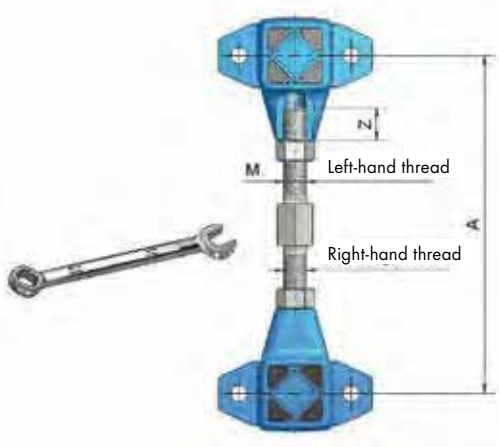
Fixation flange
AU 60

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

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 α ±5° in speed range of n_S = 300 – 600 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.

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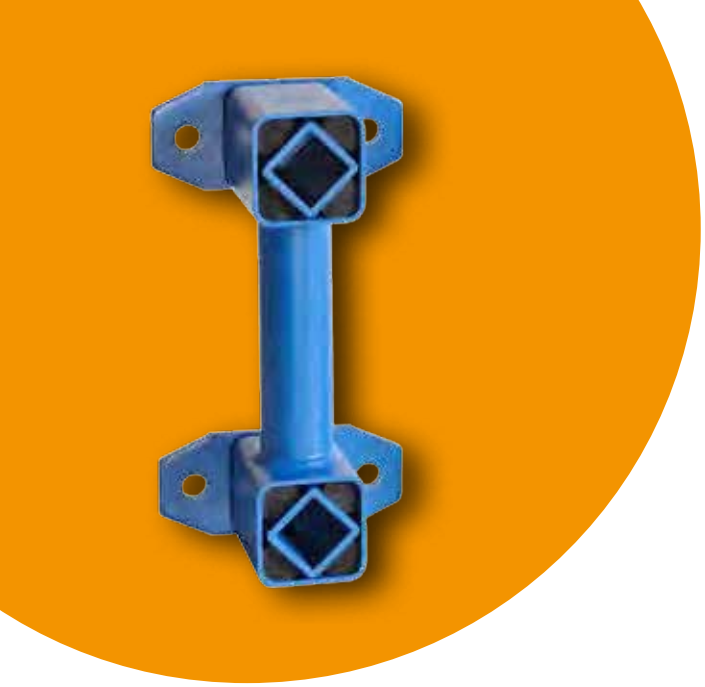
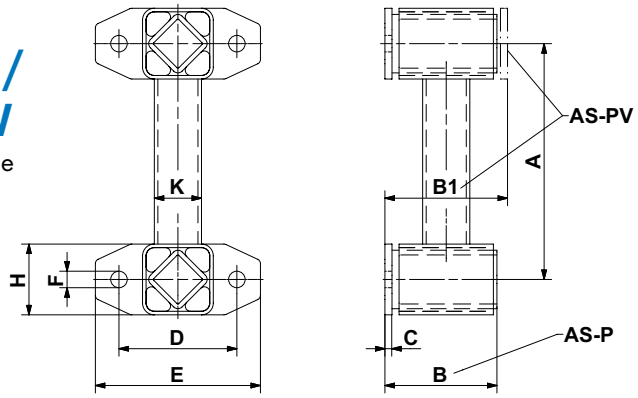


Single Rockers

AS-P / AS-PV

for flange fixation

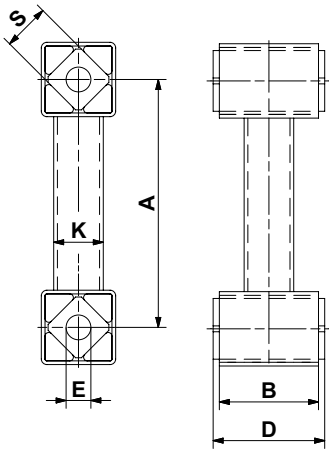


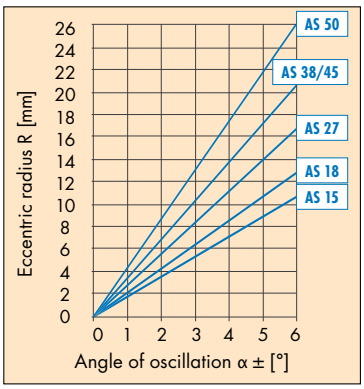
Type AS-PV with inverted flange

Art. No.	Type	G [N] K<2	cd [N/mm]	A	B	B1	C	D	E	øF	H	øK	Weight [kg]	Material structure
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								
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								
07 081 003	AS-P 27	400	12	160	73	–	5	80	110	11.5	45	34	1.8	
07 091 003	AS-PV 27				–	80								
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								
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								
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]	A	B	$D_{-0.3}^{0}$	øE	øK	□S	Weight [kg]	Material structure	
											Inner square	Housing
07 071 001	AS-C 15	100	5	100	40	45	$10^{+0.4}_{+0.2}$	18	15	0.4	Light metal profile	Steel welded construction, ROSTA blue painted
07 071 002	AS-C 18	200	11	120	50	55	$13^{0}_{-0.2}$	24	18	0.6		
07 071 003	AS-C 27	400	12	160	60	65	$16^{+0.5}_{+0.3}$	34	27	1.3		
07 071 004	AS-C 38	800	19	200	80	90	$20^{+0.5}_{+0.2}$	40	38	2.6		
07 071 005	AS-C 45	1'600	33	200	100	110	$24^{+0.5}_{+0.2}$	45	45	3.9		
07 071 006	AS-C 50	2'500	37	250	120	130	$30^{+0.5}_{+0.2}$	60	50	6.1		

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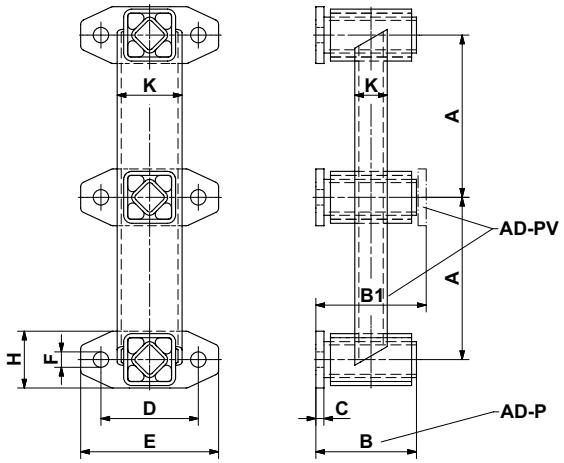
G = max. load in N per rocker, by higher K consult chapter 5 on page 2.24.
cd = dynamic spring value by oscillation angles α ±5° in speed range of ns = 300–600 min^{-1}

Further basic information and calculations on pages 2.22–2.24.

Double Rockers

AD-P / AD-PV

for flange fixation

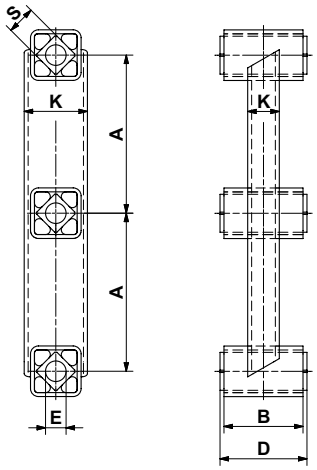


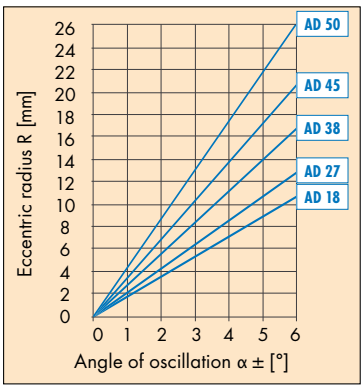
Type AD-PV with inverted flange

Art. No.	Type	G [N] K=2	G [N] K=3	cd [N/mm]	A	B	B1	C	D	E	øF	H	K	Weight [kg]	Material structure
07 111 001	**AD-P 18**	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	**AD-PV 18**					–	68								
07 111 002	**AD-P 27**	300	240	31	120	73	–	5	80	110	11.5	45	55 x 34	2.6	
07 121 002	**AD-PV 27**					–	80								
07 111 003	**AD-P 38**	600	500	45	160	95	–	6	100	140	14	60	70 x 50	5.5	
07 121 003	**AD-PV 38**					–	104								
07 111 004	**AD-P 45**	1'200	1'000	50	200	120	–	8	130	180	18	70	80 x 40	8.5	
07 121 004	**AD-PV 45**					–	132								
07 111 005	**AD-P 50**	1'800	1'500	56	250	145	–	10	140	190	18	80	90 x 50	12.9	
07 121 005	**AD-PV 50**					–	160								

AD-C

for frictional center connection





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

G = max. load in N per rocker, by different K consult chapter 5 on page 2.24.
cd = dynamic spring value by oscillation angles α ±5° in speed range of ns = 300–600 min^{-1}

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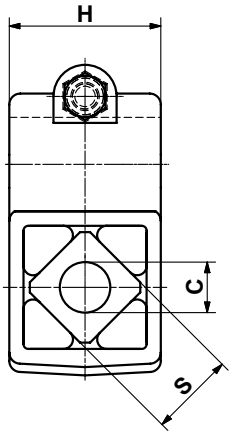
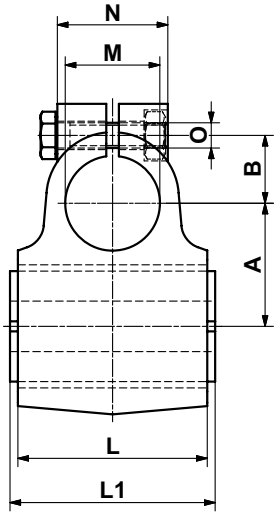
Further basic information and calculations on pages 2.22–2.24.

Oscillating Mountings

Type AR

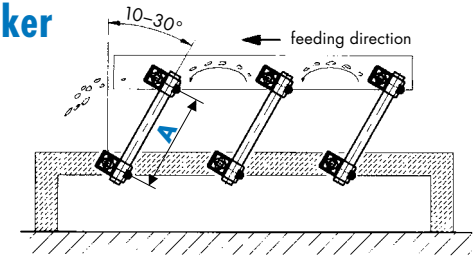




Art. No.	Type	G [N] K<2	Mdd [Nm/°]	A ±0.2	B	ø C	H	L	L1 $^{0}_{-0.3}$	ø M	N	O	□S	Weight [kg]	Material structure	
															Inner square	Housing
07 291 003	**AR 27**	400	2.6	39	21.5	16 $^{+0.5}_{+0.3}$	48	60	65	30	35	M8	27	0.5	Light metal profile	Light metal casting, ROSTA blue painted
07 291 004	**AR 38**	800	6.7	52	26.5	20 $^{+0.5}_{+0.2}$	64	80	90	40	50	M8	38	1.0		

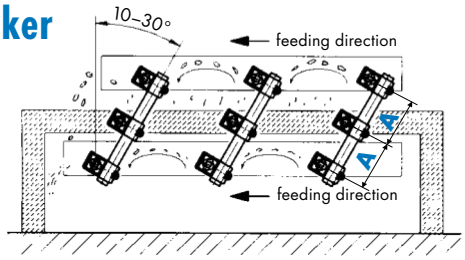
G = max. load in N per rocker, by higher K consult chapter 5 on page 2.24.
Mdd = dynamic element torque in Nm/° by oscillating angles α ±5° in speed range of ns = 300–600 min^{-1}

Single Rocker



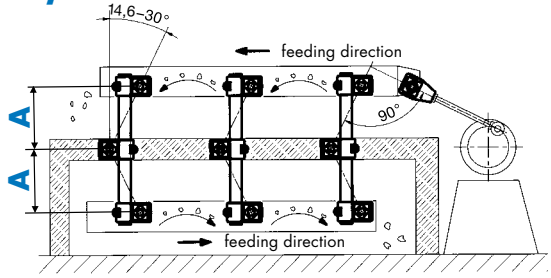
The two AR mounts are inserted on the round connecting tube. The required center distance should be positioned on the straightening plate (parallelism), subsequently tightening of the two collars with the required fastening torque.

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 β [°] 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

Further basic information and calculations on pages 2.22–2.24.
By differing center distances A, please consult ROSTA.

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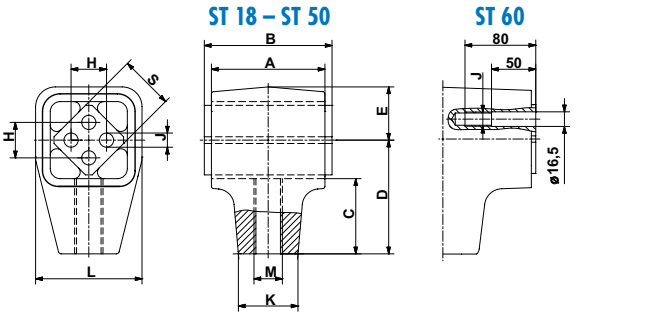
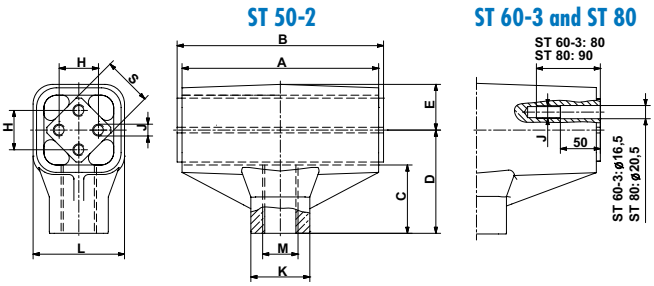
Drive Heads

Type ST





Art. No.	Type	F max. [N]	n_s [min^{-1}] max. α_{ST} ±5°	A	B	C	D	E	H	J $^{+0.5}_{0}$	□K	L	M	□S	Weight [kg]	Material structure		
07 031 001	ST 18	400	600	50	55 $^{0}_{-0.3}$	31.5	45	20	12 ±0.3	6	22	39	M12	18	0.2	Light metal casting	Light metal profile	Housing ROSTA blue painted
07 041 001	ST 18L												M12-LH					
07 031 002	ST 27	1'000	560	60	65 $^{0}_{-0.3}$	40.5	60	27	20 ±0.4	8	28	54	M16	27	0.4			
07 041 002	ST 27L												M16-LH					
07 031 003	ST 38	2'000	530	80	90 $^{0}_{-0.3}$	53	80	37	25 ±0.4	10	42	74	M20	38	1.1			
07 041 003	ST 38L												M20-LH					
07 031 004	ST 45	3'500	500	100	110 $^{0}_{-0.3}$	67	100	44	35 ±0.5	12	48	89	M24	45	1.8			
07 041 004	ST 45L												M24-LH					
07 031 005	ST 50	6'000	470	120	130 $^{0}_{-0.3}$	69.5	105	47	40 ±0.5	M12 x 40	60	93	M36	50	5.5	Nodular cast iron		
07 041 005	ST 50L												M36-LH					
new 07 031 015	ST 50-2	10'000	470	200	210 $^{0}_{-0.3}$	69.5	105	47	40 ±0.5	M12 x 40	60	93	M36	50	6.9			
new 07 041 015	ST 50-2L												M36-LH					
new 07 031 026	ST 60	13'000	440	200	210 ±0.2	85	130	59	45	M16	80	117	M42	60	15.6		Steel	ROSTA blue painted
new 07 041 026	ST 60L												M42-LH					
new 07 031 016	ST 60-3	20'000	440	300	310 ±0.2	85	130	59	45	M16	75	117	M42	60	20.2			
new 07 041 016	ST 60-3L												M42-LH					
new 07 031 027	ST 80	27'000	380	300	310 ±0.2	100	160	77	60	M20	90	150	M52	80	36.7			
new 07 041 027	ST 80L												M52-LH					

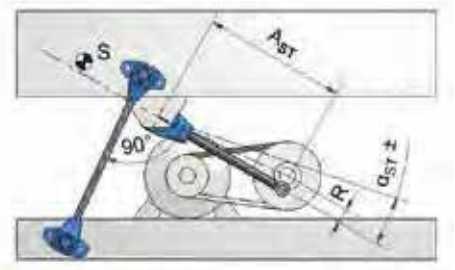
n_s = max. revolutions by oscillation angle ±5°; if osc. angle is below, higher rpm's are applicable, consult "permissible frequencies" in the Technology part of the ROSTA general catalogue.
$F_{max.}$ → Calculation of the acceleration force F on page 2.22.

Length of driving rod A_{ST} and eccentric radius R

To follow the guidelines of the permissible frequencies the angle of oscillation α_{ST} should not exceed ±5.7°. This angle is corresponding to the ratio R : A_{ST} of 1 : 10.

Calculation of the oscillation angle for ST

Eccentric radius	R [mm]	$\alpha_{ST} = \arcsin\left(\frac{R}{A_{ST}}\right)$ [°]
Center distance	A_{ST} [mm]	
Oscillation angle	α_{ST} ±[°]	



Series connection of 4 pcs. ST 50

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.

Further basic information and calculations on pages 2.22–2.24.

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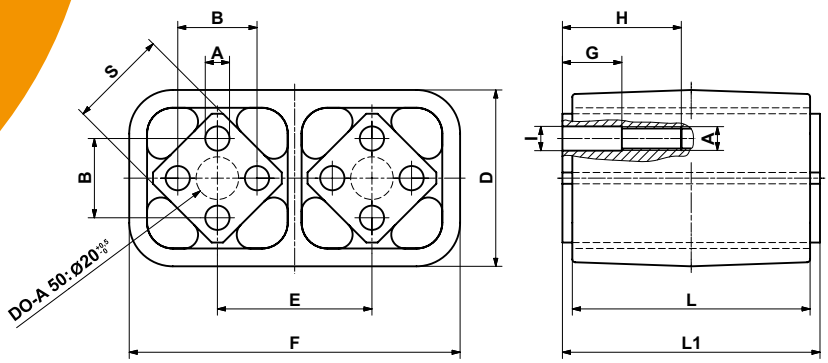
Spring Accumulators

Type DO-A



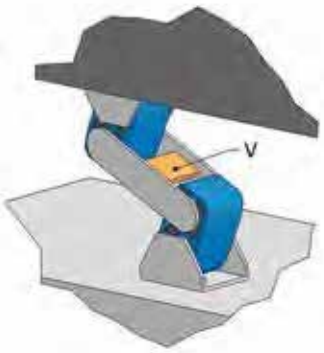
Art. No.	Type	c_s [N/mm]	A	B ±0.5	D	E	F	ø I	□S	G	H	L	L1 $^{0}_{-0.3}$	Weight [kg]	Material structure
01 041 013	**DO-A 45 x 80**	100	12 $^{+0.5}_{0}$	35	85	73	150	–	45	–	–	80	90	1.9	Light metal profile, ROSTA blue painted
01 041 014	**DO-A 45 x 100**	125								–	–	100	110	2.3	
01 041 016	**DO-A 50 x 120**	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	**DO-A 50 x 160**	255								30	60	160	170	7.4	
01 041 017	**DO-A 50 x 200**	320								40	70	200	210	8.5	

c_s = dynamic spring value of the complete accumulator by oscillating angle of ±5° and revolutions n_s between 300–600 min^{-1}

1 spring accumulator is always consisting of 2 pcs. DO-A elements!

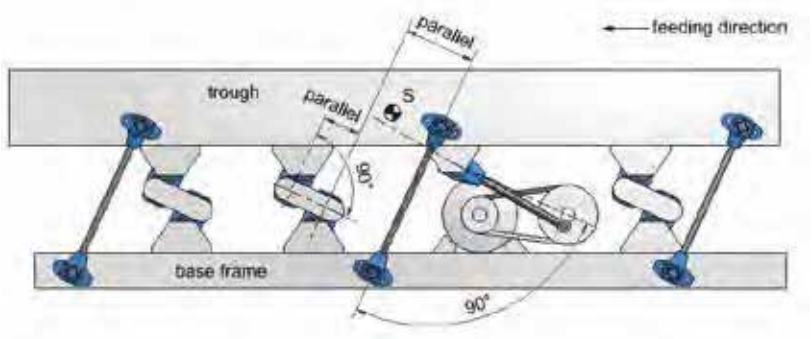
Operating parameters

Angle of oscillation DO-A (series connection)	Accumulator cons. of **2 x DO-A 45**				Accumulator cons. of **2 x DO-A 50**			
	R	sw	max. ns	max. K	R	sw	max. ns	max. K
±6°	15.3	30.6	360	2.2	16.4	32.8	340	2.1
±5°	12.8	25.6	500	3.6	13.6	27.2	470	3.4
±4°	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°) 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.



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Further basic information and calculations on pages 2.22–2.24.

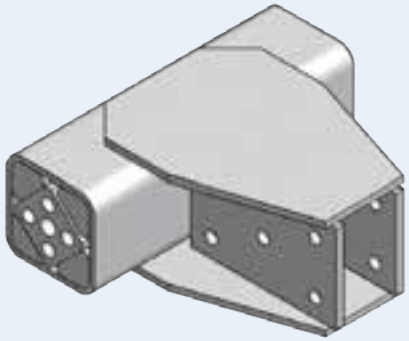
ROSTA Oscillating Mountings and Accessories for Customized Applications

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 supplys 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 centrical 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).



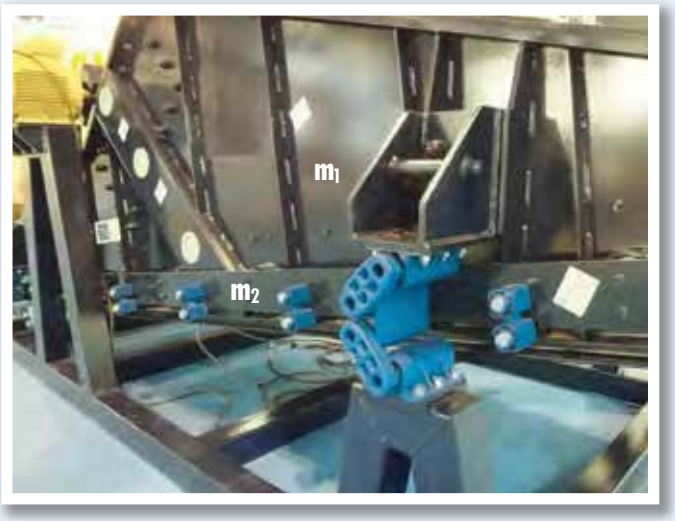
ROSTA Oscillating Mountings and Accessories for Customized Applications

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"**).



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

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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

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

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

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

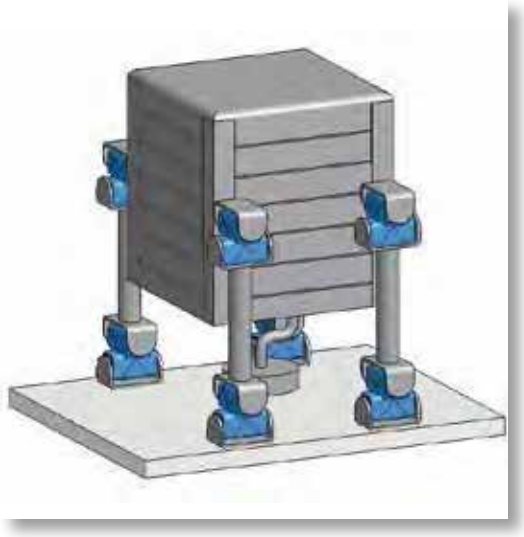
Hanging gyratory sifters

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.



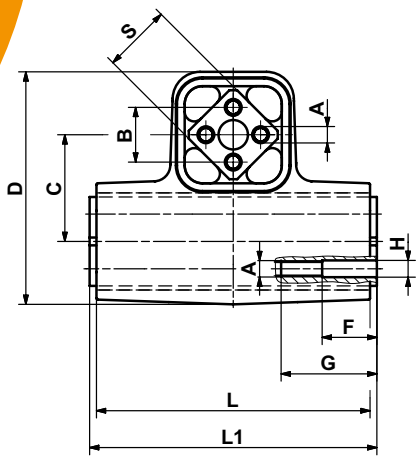
Upright staying gyratory sifters with unbalanced shaft drive

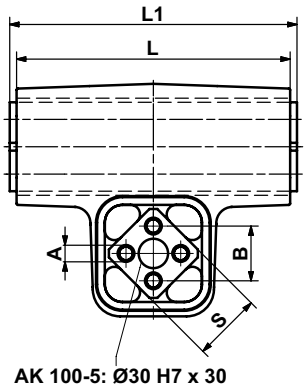
A very cost-efficient version of the upright staying gyratory sifter. Requires no complicated eccentric drive. The AK mountings or even the AV mountings must be over-dimensioned, however, due to the lack of a precisely defined guidance.

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

Oscillating Mountings for Gyratory Sifters

Type AK – Universal Joints





AK 100-5: Ø30 H7 x 30

Art. No.	Type	Max. load G [N] by system: hanging	staying crank driven	staying free oscillating	A	B	C	D	F	G	⌀ H	L	L1 ±0.2	□S
07 061 001	AK 15	160	128	80	5 $^{+0.5}_{0}$	10 ±0.2	27	54	–	–	–	60	65	15
07 061 002	AK 18	300	240	150	6 $^{+0.5}_{0}$	12 ±0.3	32	64	–	–	–	80	85	18
07 061 003	AK 27	800	640	400	8 $^{+0.5}_{0}$	20 ±0.4	45	97	–	–	–	100	105	27
07 061 004	AK 38	1'600	1'280	800	10 $^{+0.5}_{0}$	25 ±0.4	60	130	–	–	–	120	130	38
07 061 005	AK 45	3'000	2'400	1'500	12 $^{+0.5}_{0}$	35 ±0.5	72	156	–	–	–	150	160	45
07 061 011	AK 50	5'600	4'480	2'800	M12	40 ±0.5	78	172	40	70	12.25	200	210	50
07 061 012	AK 60	10'000	8'000	5'000	M16	45	100	218	50	80	16.5	300	310	60
07 061 013	AK 80	20'000	16'000	10'000	M20	60	136	283	50	90	20.5	400	410	80
07 061 009	AK 100-4	30'000	24'000	15'000	M24	75	170	354	50	100	25	400	410	100
07 061 010	AK 100-5	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: Inner square	Housing	Protection	Bolting on inner square
07 061 001	AK 15	0.4	Light metal profile	Steel welded construction	ROSTA blue painted	End-to-end screw or threaded bar quality 8.8
07 061 002	AK 18	0.6				
07 061 003	AK 27	1.9		Nodular cast iron		
07 061 004	AK 38	3.7				
07 061 005	AK 45	6.7				
07 061 011	AK 50	11.4				Shoulder studs quality 8.8 for optimizing frictional connection
07 061 012	AK 60	37.4	Steel			
07 061 013	AK 80	85.4				
07 061 009	AK 100-4	124				
07 061 010	AK 100-5	137		Steel welded construct.		

Usual drive parameters out of practice

– Driving speed n_s up to approx. 380 min^{-1}
– Oscillation angle α up to approx. ±3.5°

General advises

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

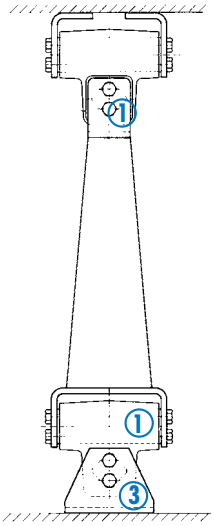
Calculation Example

Machine type: staying sifter with positive crank drive

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

Installation guidelines for AK universal joints

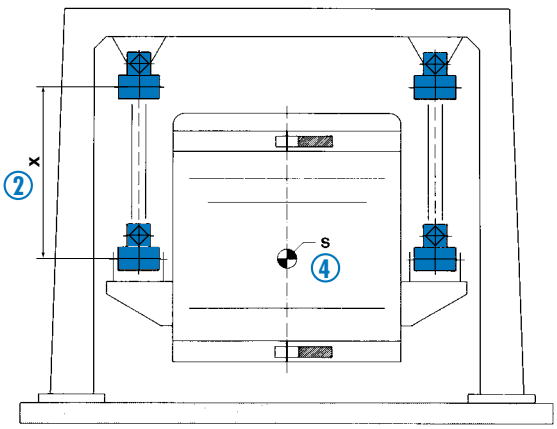


① Install the two AK per column in the same line, in order that the distance X between the two inner squares of the 90° "distorted" element parts and the two inner squares of the "in-line" element parts is identical.

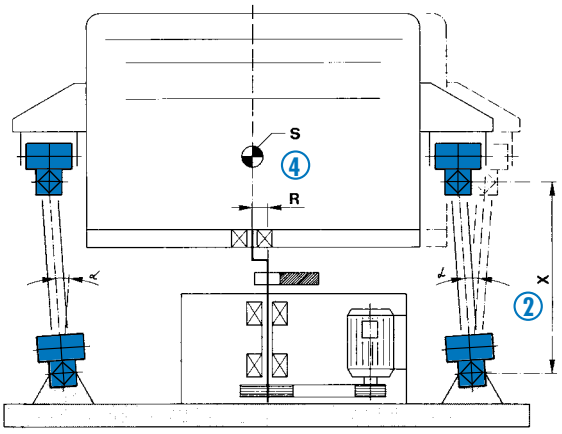
② Install the four identical connection columns (provided by the customer) between the two AK. Also by slightly inclined screen-boxes the distance or length X of the connection columns has to be identical – compensate the inclination with e.g. the higher positioning of the fixation brackets by the discharge-end 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

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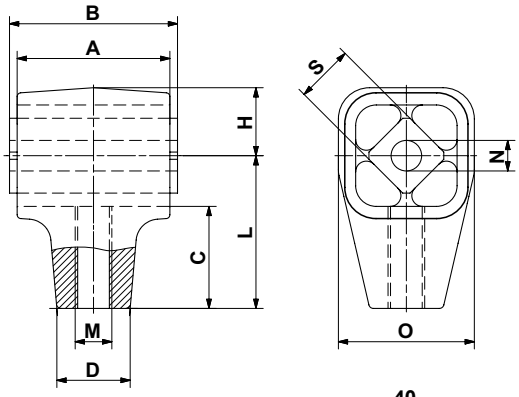
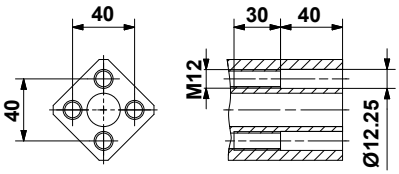
Oscillating Mountings for hanging Gyratory Sifters

Type AV





Inner square AV 50 and AV 50L

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

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

Art. No.	Type	Weight [kg]	Material structure: Inner square	Material structure: Housing	Material structure: Prot.	Bolting on inner square
07 261 001	**AV 18**	0.4	Light metal profile	Light metal casting	ROSTA blue painted	End-to-end screw or threaded bar quality 8.8.
07 271 001	**AV 18L**					
07 261 002	**AV 27**	1.0				
07 271 002	**AV 27L**					
07 261 003	**AV 38**	1.7				
07 271 003	**AV 38L**					
new 07 261 014	**AV 40**	5.0		Nodular cast iron		
new 07 271 014	**AV 40L**					
07 261 005	**AV 50**	12.3				M12 shoulder studs quality 8.8.
07 271 005	**AV 50L**					

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.

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Calculation Example

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

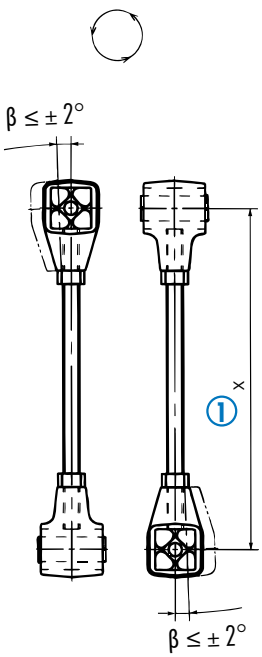
② Only the **crosswise** (90° offset) installation of the two AV elements per suspension rod is guaranteeing for a harmonic and circular motion of the screen-box.

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° 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.)

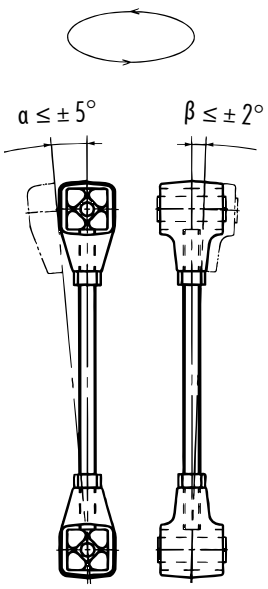
④ To avoid unwanted tilting motions or screen-box distortions (by standstill) we do recommend the installation of the lower AV-brackets on the level of the center of gravity "S" of the screen-box.

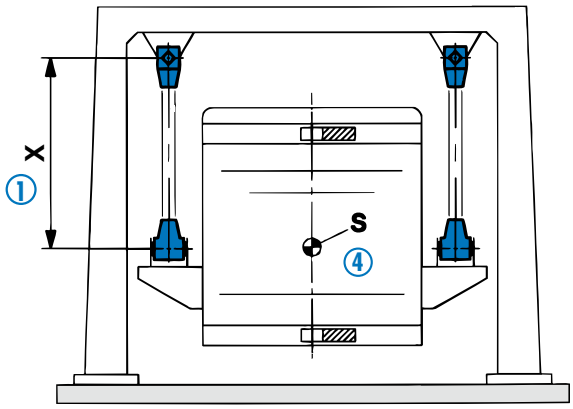
⑤ Please consult ROSTA by the selection of AV elements for staying, free oscillating gyratory sifters.

② circular oscillation



③ elliptical oscillation ("ROTEX" sifter types)





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Swinging Applications!

Examples:

Oscillating Mountings

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E-Mail info@rosta.ch
Internet www.rosta.com

T2014.835

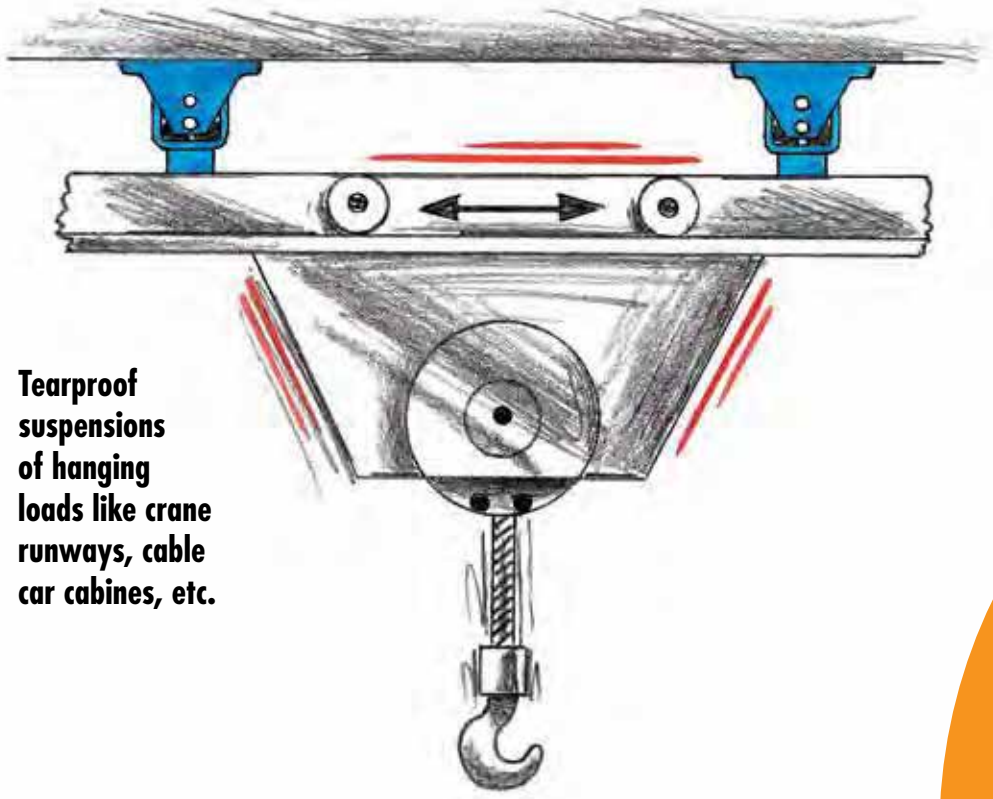
ROSTA Anti-vibration Mounts

Shock and Vibration absorbing Machine Mounts
high degree of isolation – tearproof – absorption of solid-borne noise

ROSTA
swinging solutions

ROSTA Anti-

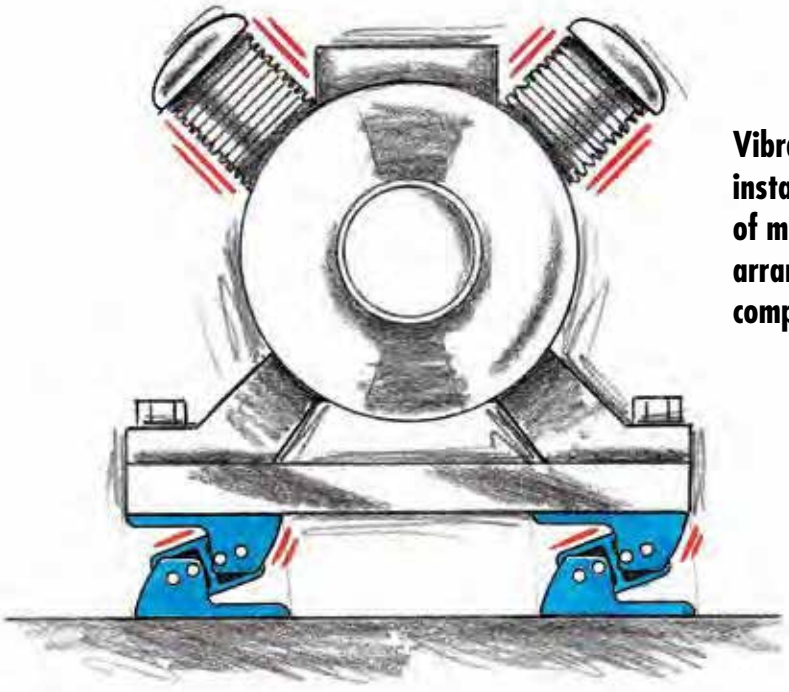
highly elastical and fully tearproof vibration



Tearproof suspensions of hanging loads like crane runways, cable car cabines, etc.

ESL

N



Vibration-free installations of motor test arrangements, compressors, etc.

long lasting
maintenance-free
absorbing solid-borne noise

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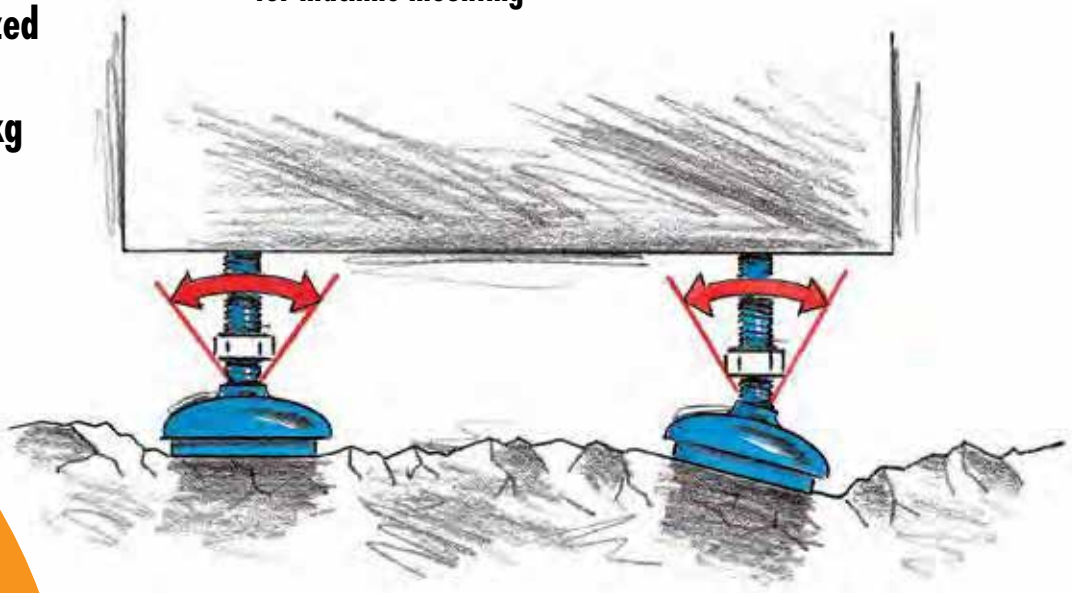
vibration Mounts

dampers based on torsional rubber pivots

Wide range of standardized mounts, for load capacities of 20–2'000 kg

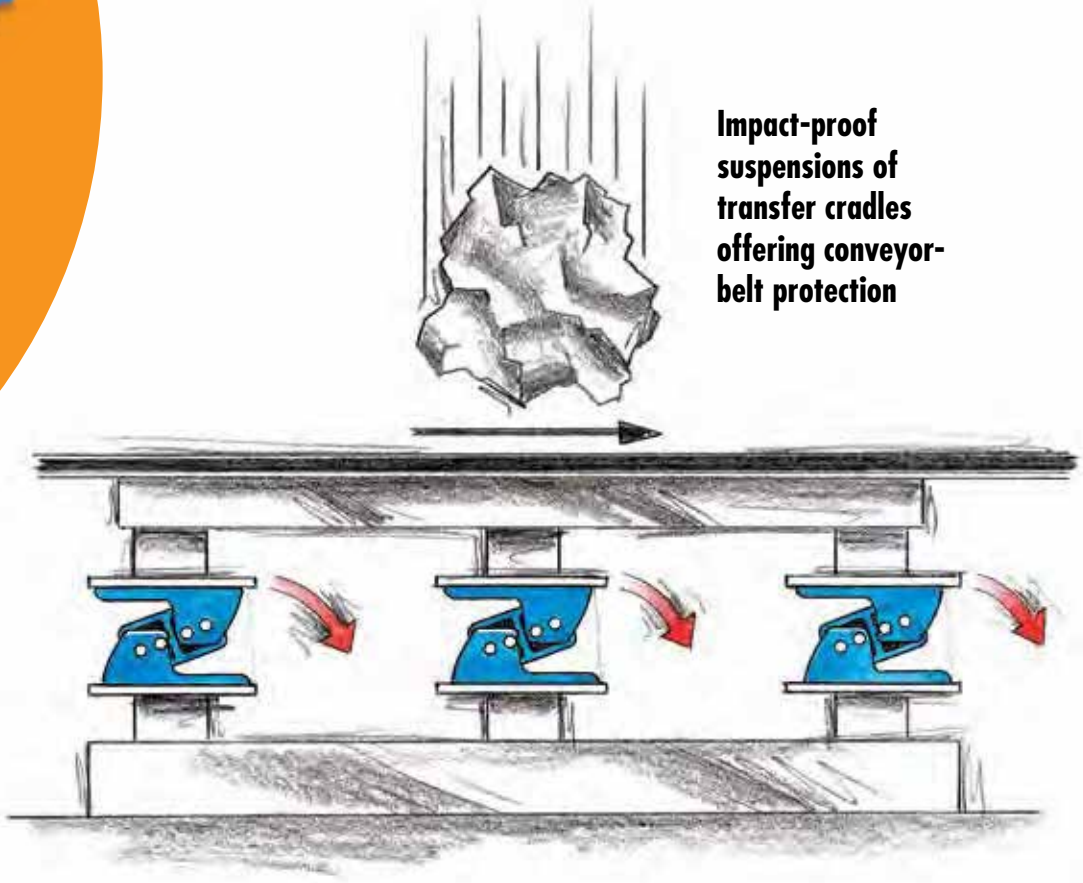
Shock absorbing levelling feet for machine mounting



V

ISOCOL

Impact-proof suspensions of transfer cradles offering conveyor-belt protection



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Selection table for Anti-vibration Mounts

Type	Description	Details	Illustration
ESL	**Anti-vibration Mounts** for the absorption of tensile, pressure and shear load. Also ideal for wall and ceiling installations. **8 load sizes from 200 N to 19'000 N per mount.** Natural frequency between 3,5 – 8 Hz. Mounts are mainly used for overcritical machine installations (machine frequency > mount frequency).	Page 3.8 – 3.9	
V	**Anti-vibration Mounts** for the absorption of tensile, pressure and shear load. Also ideal for wall and ceiling installations. **6 load sizes from 300 N to 12'000 N per mount**. Natural frequency between 10 – 30 Hz. Mounts can be used for subcritical machine installations (machine frequency < mount frequency).	Page 3.10 – 3.11	
N	**Mounting Feets** consisting of insulating plate, glued-on top cover with built-in levelling jackscrew with spherical joint for compensation of up to 5° of floor unevenness. Insulating plate oil- and acid-proof. **3 load sizes from 1'500 N to 20'000 N per mount.** Natural frequency between 19 – 25 Hz.	Page 3.12	
NOX	**Mounting Feets** consisting of insulating plate, **stainless steel** glued-on top cover with built-in **stainless** levelling jackscrew with spherical joint for compensation of up to 5° of floor unevenness. Insulating plate oil- and acid-proof. **2 load sizes from 5'000 N to 20'000 N per mount.** Natural frequency between 19 – 22 Hz.	Page 3.12	
Base plate P	**Accessories:** For all N and NOX mounting feet light metal cast **base plates** are available for the compensation of possible shear loads and/or for the positioning of the installation on the floor.	Page 3.12	
ISOCOL	**Adhesive cushioning plates,** self-adhesive plates for the installation of smaller machines/equipments. Plates oil- and acid-proof. (Adhesive power can be increased by moistening the plate with nitro thinner.)	Page 3.13	
ISOCOL U	**Adhesive cushioning plates,** self-adhesive plates with glued-on cast cover. With central hollow in cover for the positioning of the levelling jackscrew – also with lateral stop bar for machine positioning.	Page 3.13	

Further information to customized elements and installation examples as from page 3.14.

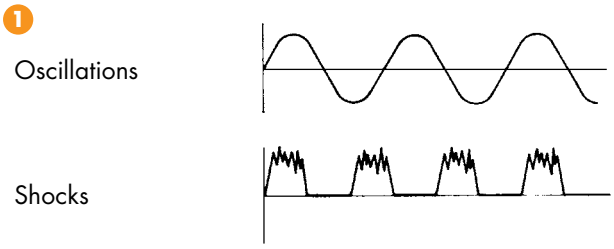
Technology Anti-vibration Mounts

Manufacturers and suppliers of anti-vibration mounts usually offer different types of machine mount with varying natural frequencies to meet the required **detuning** between the excitation frequency of the machine and the natural frequency of the anti-vibration mount.

1. Isolation of Oscillations and Shocks

The vibration technology basically differentiates between two principal types of oscillation appearances (fig. 1). Sinusoidal oscillations of working equipments are usually amortised in an **overcritical** installation manner, shocks and impacts in a **subcritical** mounting manner.

1



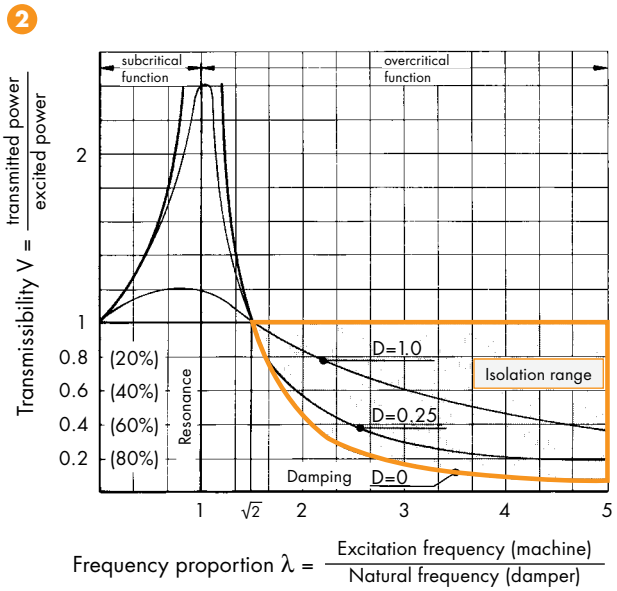
Frequency Proportion λ (fig. 2)

λ > √2: **Overcritical**
efficient vibration isolation, clearly definable effectiveness, also efficient solid-borne noise absorption

λ = 1: **Resonance field**
uncontrolled swing-up, in the long term destructive for machine and mounts

λ < 1: **Subcritical**
vibration isolation not definable, isolation results have to be measured out (before and after mount installation).

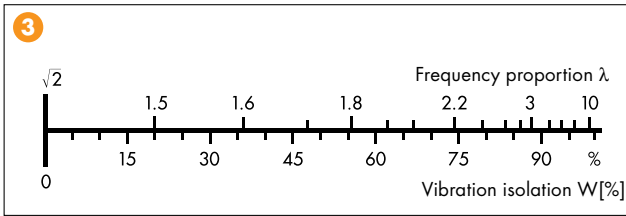
2



Overcritical installations (λ > √2)

On overcritical installations the natural frequency of the mounts should show at least a detuning factor of 1:1,414 in regard to the excitation frequency of the machine. Usually, very efficient anti-vibration mounts feature a deep deflection capability offering a low natural frequency. Most of the generators, compressors, blowers and chargers are, therefore, in **overcritical** manner installed on relatively "soft" mounts. The resulting **detuning proportion** provides information about the expected **isolation-effectiveness** in % of the machine suspension. The adjacent chart (fig. 3) and the calculation formula (fig. 4) inform about the resulting vibration isolation in %.

3



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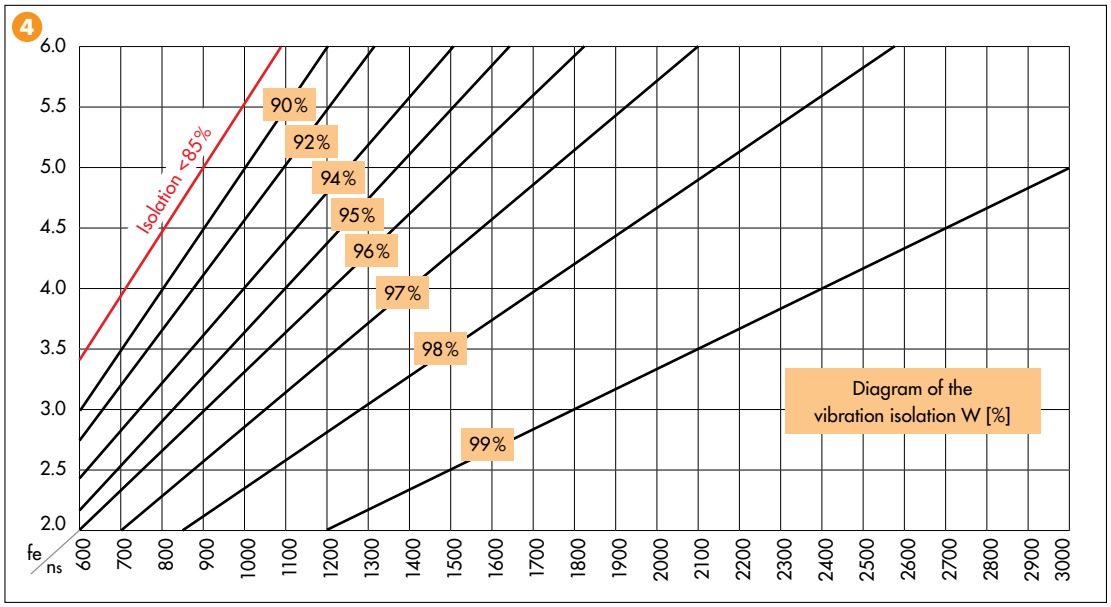


Vibration isolation

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

n_s =
Revolution exciter (machine) [rpm]

fe =
Natural frequency damper [Hz]

Resonance field (λ = 1)

At equal values of the excitation frequency and the mount natural frequency an uncontrollable swing-up of machine and damper occurs. In the long run, this appearance will be destructive for machine and mount (fig. 2).

Subcritical installations (λ < 1)

On subcritical installations (fig. 2) an anti-vibration mount with high mechanical stiffness and only small deflection behaviours should be chosen, e. g. ROSTA V mounts (high machine stability on mounts). In spite of the fact that the degree of isolation is not definable, this suspension efficiently absorbs **shocks** and **impacts** generated by relatively slow turning machines like e. g. mixers, crushers (cone-crushers), punching presses, sheet iron shears, etc. On **subcritical** installations the degree of isolation is not definable. Isolation results have to be measured out (before and after mount installation).

2. Solid-borne Noise Isolation

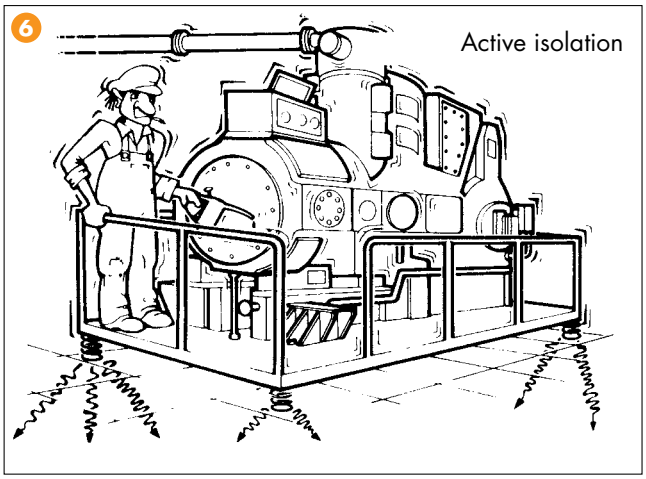
Whereas the isolation of mechanically generated oscillations and shocks are determined and dissipated by means of the aforementioned vibration dampening theory, the **solid-borne noise isolation** is subject to the technology of wave mechanics. The dampening effect is related to the proportion of the relevant acoustic resistance (acoustic resistance or wave resistance = acoustic velocity x material density). The adjacent chart (fig. 5) shows some comparative values of the resulting isolation proportions. Generally, using a rubber-steel composite mount, an ideal isolation result of the solid-borne noise can be expected – through the entire frequency range.

5

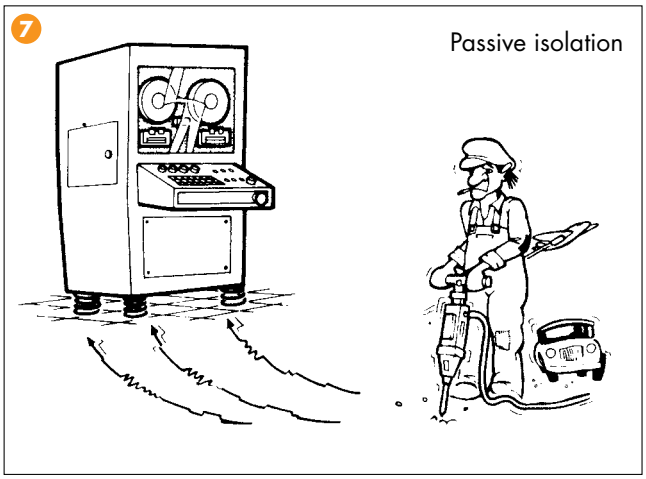
Acoustic isolation, related to steel:	Steel	1 : 1
	Bronze	1 : 1.3
	Cork	1 : 400
	Rubber	**1 : 800**
	Air	1 : 90 000

3. Active and Passive Isolation

Active or direct isolation (fig. 6) means the direct absorption of oscillations, vibrations and shocks of a running machine by anti-vibration mounts, i. e. to prevent **directly** the transfer of the numerous machine vibrations into the substructure, basis frame and entire building. For the anti-vibration mount selection the knowledge of the interfering frequency (**disturbance frequency**), the stiffness of the machine structure and its gravity center as well as of the specific machine location in the building is required. Active isolations are usually **overcritical** machine installations on anti-vibration mounts (e. g. on ROSTA ESL mounts).



Passive or protective isolation (fig. 7) means to install a protective barrier between all kind of existing vibrations and shocks occurring in a factory or workshop towards sensitive installations like e. g. weighing and measuring instruments, laboratory equipment or electronic control units. The vibration technological situations usually vary in each case and are related to environmental situations, too. Often shocks and impacts come from outside, e. g. from motorways, railways, building sites or tooling machines, like punching presses, etc. Generally, the sensitive equipments shall be protected by installing them on rather "soft" anti-vibration mounts, e. g. ROSTA ESL or AB-D mounts absorbing most of these environmental impacts. It is frequently recommendable to consult also an engineering company having the tools and instruments to analyse the specific vibration appearances.

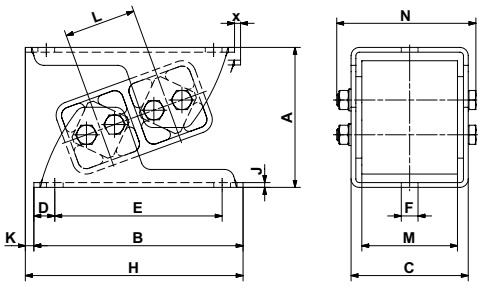


Protective suspension mounts for e.g. tooling machines are usually rather "hard" and show only little deflection under load. Too soft tooling machine mounts could actuate bending of the machine base what would influence negatively the precision of the work piece machining. Therefore, mounting feet for tooling machines are often consisting of hard rubber cushions deflecting only a few millimetres under load, but "shield" all combined vibration and shock appearances from the sensitive precision machine. Transmitted shocks and vibrations could affect the clean surface finishing of the work piece. Of course, in the interest of the fully horizontal positioning of the tooling machines, these anti-vibration mounts have to dispose of a levelling jackscrew with spherical joint for the compensation of the possible floor unevenness (e. g. ROSTA N or NOX mounts).

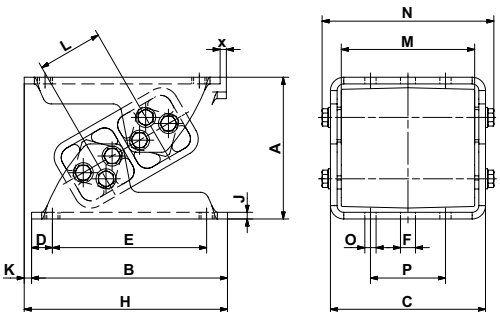
Anti-vibration Mounts

Type ESL

up to ESL 45



as from ESL 50



Art. No.	Type	Load Gmin. – Gmax. [N] on Z-axis	A un-loaded	A* max. load	B	C	D	E	øF	H	J	K	L	M	N	Weight [kg]
05 021 001	ESL 15	200 – 550	54	43	85	49	10	65	7	91	2	5.5	25.5	40	58.5	0.4
05 021 002	ESL 18	450 – 1'250	65	51	105	60	12.5	80	9.5	111	2.5	5.5	31	50	69	0.6
05 021 003	ESL 27	700 – 2'000	88	68	140	71	15	110	11.5	148	3	8	44	60	85.3	1.3
05 021 004	ESL 38	1'300 – 3'800	117	91	175	98	17.5	140	14	182	4	7	60	80	117	3.4
05 021 005	ESL 45	2'200 – 6'000	143	110	220	120	25	170	18	235	5	13	73	100	138	5.3
new 05 021 016	ESL 50	4'000 – 11'000	170	138	235	142	25	185	18	244	6	9	78	120	162	10.8
new 05 021 017	ESL 50-1.6	5'500 – 15'000	170	138	235	186	25	185	18	244	8	9	78	160	206	15.4
new 05 021 018	ESL 50-2	7'000 – 19'000	170	138	235	226	25	185	18	244	8	9	78	200	246	17.8

Art. No.	Type	Natural frequency Gmin. – Gmax. [Hz]	O	P	x max.	Material structure (zinc-plated screws)
05 021 001	ESL 15	8.2 – 5.8	-	-	1.5	Light metal profiles, steel brackets, ROSTA blue painted
05 021 002	ESL 18	7.5 – 5.0	-	-	1.9	
05 021 003	ESL 27	6.2 – 4.5	-	-	2.7	
05 021 004	ESL 38	5.5 – 4.0	-	-	3.6	
05 021 005	ESL 45	5.0 – 3.5	-	-	4.4	
new 05 021 016	ESL 50	5.0 – 3.5	13.5	90	10	Light metal profiles, cast housings, steel brackets, ROSTA blue painted
new 05 021 017	ESL 50-1.6	5.0 – 3.5	13.5	90	10	
new 05 021 018	ESL 50-2	5.0 – 3.5	13.5	90	10	

The max. load on **X-axis** should not exceed **200%** of the Z-axis capacity.

The max. load on **Y-axis** should not exceed **20%** of the Z-axis capacity.

Applicable on tensile, pressure and shear load.

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).

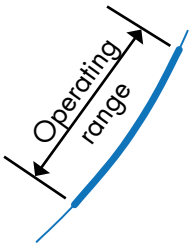
Guidelines concerning customized mounts and examples as from page 3.14.

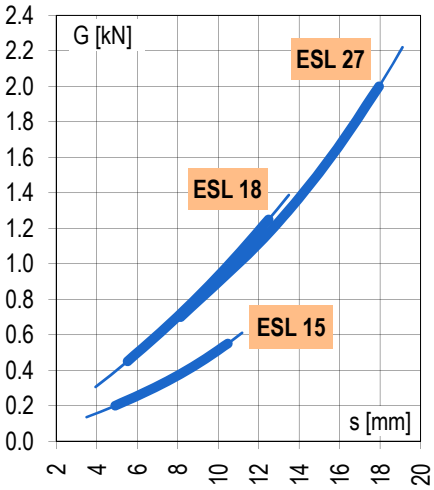
Anti-vibration Mounts

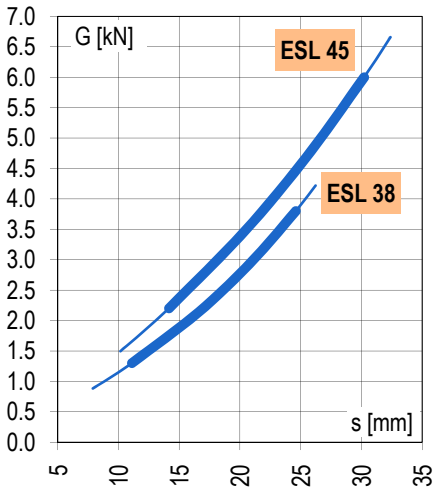
Type ESL

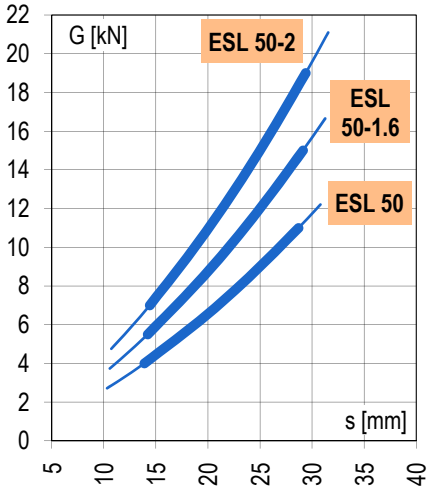
Deflection curves and cold flow behaviour

The below mentioned deflection values are comprising the initial cold flow, occurring after a few hours of operation.
The final cold flow (after one year) is usually **s x 1.09.**
The mentioned deflection values are not suitable for type testing. Please consult also our tolerance data in the general catalogue, chapter "Technology".



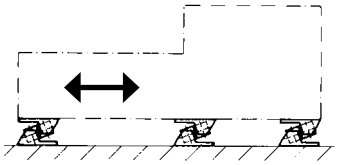




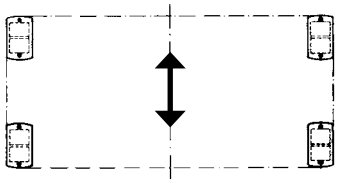


Installation guidelines

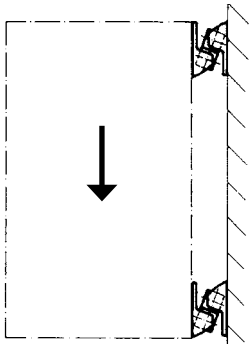
The ESL elements must generally be installed in the same direction.



Dynamic forces longitudinal



Dynamic forces lateral



Wall mounting

Applications

For active and passive isolation of vibrations and maximum damping of solid-borne noise transmission in weighbridges and scales, measuring systems, control equipment, rotary machinery such as compressors, refrigerating systems, blowers, pumps, mills, mixers, shock-absorbent buffers, etc.

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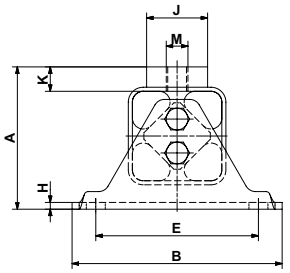
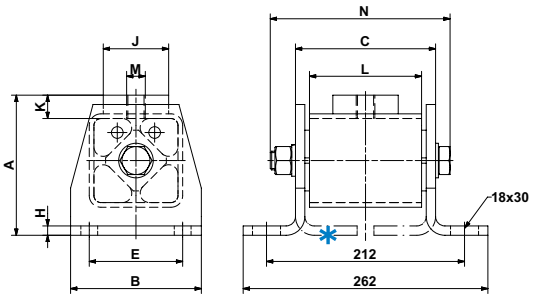
Anti-vibration Mounts

Type V

up to V 45



V 50



* Alternativ mounting position 180° turned.

Art. No.	Type	Load Gmin. – Gmax. [N] on X- and Z-axis	A	B	C	E	øF	H	øJ	K	L	M	N	Weight [kg]
05 011 001	V 15	300 – 800	49	80	51	55	9.5	3	20	10	40	M10	59	0.3
05 011 002	V 18	600 – 1'600	66	100	62	75	9.5	3.5	30	13	50	M10	74	0.7
05 011 003	V 27	1'300 – 3'000	84	130	73	100	11.5	4	40	14.5	60	M12	85	1.3
new 05 011 024	V 38	2'600 – 5'000	105	155	100	120	14	5	45	17.5	80	M16	117	2.7
05 011 005	V 45	4'500 – 8'000	127	190	122	140	18	6	60	22.5	100	M20	143	4.6
05 011 006	V 50	6'000 – 12'000	150	140	150	100	-	10	70	25	120	M20	193	7.5

Art. No.	Type	Natural frequency Gmin. – Gmax. [Hz]	Material structure (zinc-plated screws)
05 011 001	V 15	30 – 23	Light metal profiles, welded steel housings, ROSTA blue painted
05 011 002	V 18	25 – 15	
05 011 003	V 27	28 – 20	
new 05 011 024	V 38	14 – 12	
05 011 005	V 45	15 – 12	
05 011 006	V 50	12 – 10	

The max. load on **Y-axis** should not exceed **20%** of the X- resp. Z-axis capacity.

Momentary shock loads of 2.5 g in X- and Z-axis admissible.

Applicable on tensile, pressure and shear load.

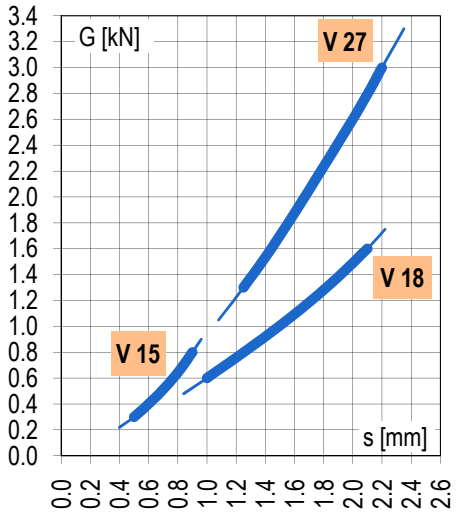
Further information to customized elements and installation examples as from page 3.14.

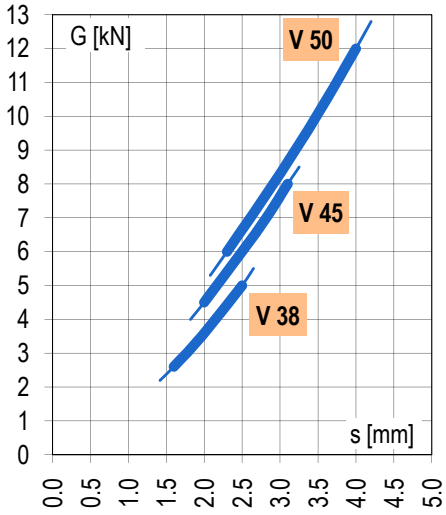
Anti-vibration Mounts

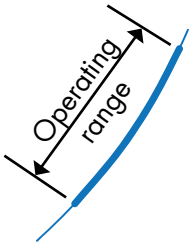
Type V

Deflection curves

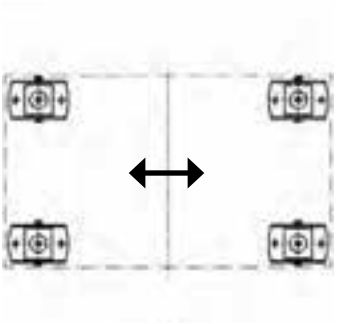
The mentioned deflection values are not suitable for type testing. Please consult also our tolerance data in the general catalogue, chapter "Technology".



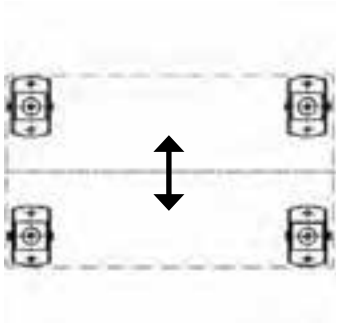




Installation guidelines

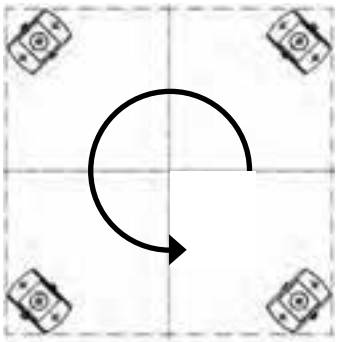


Dynamic forces longitudinal



Dynamic forces lateral

45° diagonal configuration by rotary motions. Reduced load capacities.



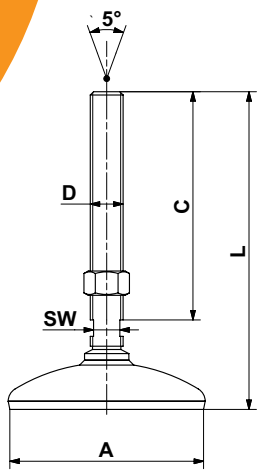
e. g. mixer, crusher installation

Applications

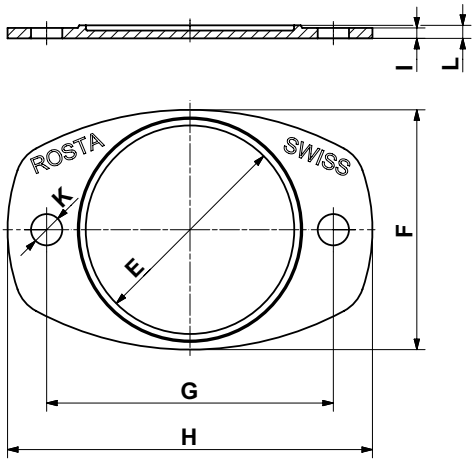
For active and passive isolation of vibrations and damping of solid-borne noise transmission in crushing plants, compressors, blowers, pumps, rotary converters, generators, mills, crane track supports, etc.

Mounting Feets

Type N
Type NOX



Accessory:
Base plate P



N and NOX

Art. No.	Type	Load Gmin. – Gmax. [N]	Natural frequency Gmin. – Gmax. [Hz]	øA	C	D	L	SW	Weight [kg]	Material structure (rubber pad NBR with 50 ShA)
05 058 001	**N 80 M12**	1'500 – 6'000	25 – 22	80	55	M12	100	10	0.3	zinced, cover blue painted
05 058 002	**N 80 M16**	5'000 – 12'000	22 – 19	80	136	M16	182	13	0.5	zinced, cover blue painted
05 058 102	**NOX 80 M16**									stainless steel 1.4301 and 1.4305
05 058 004	**N 120 M20**	10'000 – 20'000	22 – 19	120	139	M20	195	16	1.0	zinced, cover blue painted
05 058 103	**NOX 120 M20**									stainless steel 1.4301 and 1.4305

Base plate P

Art. No.	Type	Accessory to	øE	F	G	H	I	øK	L	Weight [kg]	Material structure
05 060 101	**P 80**	N / NOX 80	80	92	110	140	4	12	5	0.1	Light metal cast
05 060 102	**P 120**	N / NOX 120	120	135	170	210	5	16	7	0.3	

Options by high volume supplies

– other thread sizes and lengths
– higher load capacities
– other painting
– imprint of company logo

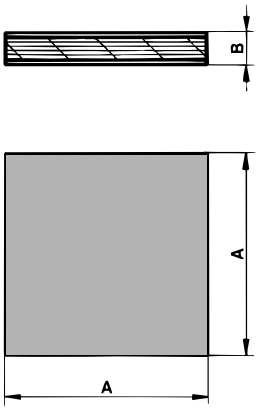
Applications

For the isolation of vibrations and solid-borne noise, also for machinery and apparatus requiring levelling, such as air conditioning plants, woodworking machinery, pumps, tanks, containers, transport systems, tooling machines, assembly lines and workshop equipment.

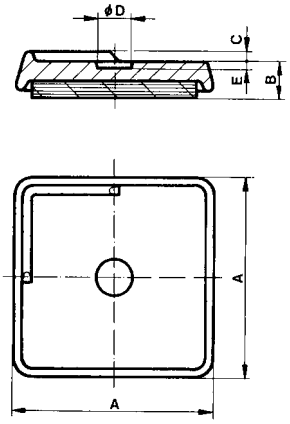
For further information to customized elements and installation examples as from page 3.14.

Adhesive cushioning plates

Type ISOCOL



Type ISOCOL U



Art. No.	Type	Load Gmin. – Gmax. [N]	Natural frequency Gmin. – Gmax. [Hz]	A	B	C	øD	E	Weight [kg]	Material structure
05 030 001	**ISOCOL 50**	500 – 1'500	25 – 16	50	8	-	-	-	0.02	Rubber NBR/SBR with 40 ShA. ISOCOL U with cast cover.
05 040 001	**ISOCOL U 50**			60	14	3	11	2	0.15	
05 030 002	**ISOCOL 80**	1'200 – 3'800	25 – 16	80	8	-	-	-	0.05	
05 040 002	**ISOCOL U 80**			90	15	3	14	2	0.40	
05 030 003	**ISOCOL 400**	32'000 – 96'000*	25 – 16	400	8	-	-	-	1.30	

Installation Guidelines

In order to obtain optimal stabilisation of the machine, it is recommended to allow the ISOCOL plates to protude approx. 10 mm from the machine base. The single plates must be mounted such as the load is evenly distributed.

In cases where levelling is not necessary the ISOCOL U elements can be layed directly under the machine base, up to the lateral stops. Additional fixation is not necessary.

In case the machine frame includes a levelling screw, the central hollow of the ISOCOL U mounting is placed directly under the screw, which allows the accurate levelling.

Applications

For extremely low installation situations, for the damping of vibrations and solid-borne noise, under air conditioning plants, heating boilers, pumps, office machines, laboratory equipment, wood working machines and workshop equipment, etc.

Notice

The deflection of the cushioning plates by the mentioned max. catalogue load capacities is 1.5 mm.

* Besides the mentioned catalogue dimensions, these cushioning plates are also available in sheet-dimensions 400x400 mm = ISOCOL 400. Relevant footprint shapes can easily be cutted out by means of carpet cutters. Calculation of load capacity with 20 to 60 N/cm².

For further information to customized elements and installation examples as from page 3.14.

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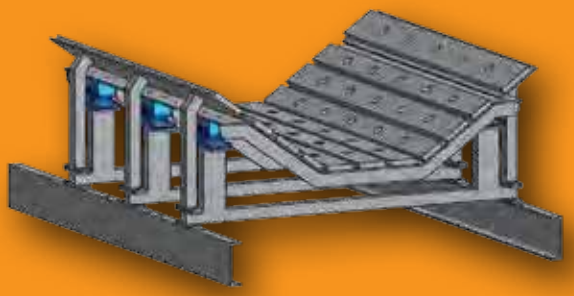

ROSTA Anti-vibration Mounts type ESL as impact absorbing suspensions of transfer stations in belt conveyor systems

Table: Size and quantity of ESL for the absorption of the occurring kinetic energy

Weight biggest lump [kg]	Height of fall [m] 1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
10	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
20	4	4	4	4	4	4	4	4	4	6	6	6	6	6	6	6	6	6	6
30	4	4	4	4	4	6	6	6	6	6	6	6	6	6	8	8	8	8	8
40	4	4	4	4	6	6	6	6	6	6	8	8	8	8	6	6	6	6	6
50	4	4	4	6	6	6	6	6	8	8	8	6	6	6	6	6	6	8	8
60	4	4	6	6	6	6	8	8	8	6	6	6	6	6	8	8	8	8	8
70	4	6	6	6	6	8	8	6	6	6	6	6	8	8	8	8	8	8	8
80	4	6	6	6	8	8	6	6	6	6	8	8	8	8	8	8	8	8	8
90	4	6	6	6	8	6	6	6	6	8	8	8	8	8	8	8	8	8	8
100	4	6	6	8	8	6	6	6	8	8	8	8	8	8	8	8	8	8	8
110	6	6	6	8	6	6	6	8	8	8	8	8	8	8	8	8	8	10	10
120	6	6	8	8	6	6	8	8	8	8	8	8	8	8	8	10	10	10	10
130	6	6	8	6	6	6	8	8	8	8	8	8	8	8	10	10	10	10	12
140	6	6	8	6	6	8	8	8	8	8	8	8	8	10	10	10	10	12	12
150	6	6	8	6	6	8	8	8	8	8	8	8	10	10	10	12	12	12	12
200	6	8	6	8	8	8	8	8	8	10	10	12	12	12	14	14	16	16	16
300	8	6	8	8	8	10	10	12	12	14	16	16							
400	6	8	8	8	10	12	14	16	16										
500	8	8	8	10	12	14	16												

	Max. absorption of energy per ESL
ESL 38	250 Nm
ESL 45	375 Nm
ESL 50	750 Nm
ESL 50-1.6	1000 Nm
ESL 50-2	1250 Nm

At the transfer stations of large belt conveyor systems for the pit and quarry industries, some belt damages may occur on the next downstream conveyor generated by the high impact force of falling sharp-edged mineral lumps. Furthermore, the continuously undamped material impacts of sharp and abrasive mineral lumps cause a high material wear on the very expensive belts, shortening considerably their lifetime.

Transfer or impact stations equipped with ROSTA anti-vibration mounts type ESL offer an effective absorption of the occurring kinetic energy of falling lumps with their progressive deflection characteristics. The belt surface is protected from scissures and high abrasion wear. **Please ask for our specific information manual "Impact Beds" and "Elastic Garland Suspensions".**

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ROSTA Anti-vibration Mounts as customized system elements

Cost optimized anti-vibration mount type V 18 for large series application

Pre-investment study for a high volume need of anti-vibration mounts type V 18. The housing of the mount is planned as "endless" light metal extrusion profile, cut in required element lengths.

Cab assembly suspension on all-wheel crane truck

Tearproof low frequency suspension of the driver's cab on an off-road crane truck. These specific crane trucks are planned for the employment in pathless areas for the pipeline emplacement. The elastic suspensions of the driver's cab shall offer a high comfort at road transfer of the vehicle – and should offer a very high side stability while off-road acting without indefinable "floatage" of the cab. Cab suspension with four ESL 50 mounts and customized brackets.

Tearproof mounting of wind generators on anti-vibration mounts type V 45

Tearproof installation of wind generators on high steel girder masts and building roofs. On the one hand the anti-vibration mounts type V 45 avoid the transmission of vibrations and solid-borne noise from the wind generator on the building or structure, on the other hand the absolutely tearproof suspensions offer safe stability at strong wind emergence.

Impact cushioning mounts type ST-R on transfer stations in belt conveyor systems

Protective suspensions of roller garlands on belt transfer stations. The garland rollers in bulk material stations are elastically mounted on ROSTA Anti-vibration Mounts type ST-R. With the impact of heavy lumps, the ST-R mount absorbs the high kinetic energy in describing a deflection arc. The progressive spring characteristics of these mounts protect the belt surface from scissures and high abrasion.

Selection of the ST-R garland suspension:

Height of fall (lumps)

Grain size (diameter)	0.5 m	0.75 m	1.0 m	1.5 m
ø 350 mm	ST-R 38	ST-R 38	ST-R 45	ST-R 45
ø 250 mm	ST-R 27	ST-R 38	ST-R 38	ST-R 45
ø 200 mm	ST-R 27	ST-R 27	ST-R 27	ST-R 38
ø 150 mm	ST-R 27	ST-R 27	ST-R 27	ST-R 27

Basics:

- ST-R installation of a single garland always by pairs
- Always at least 4 to 5 garlands with elastic suspensions in each transfer station
- For belt widths of 800 to 1'200 mm
- For specific material weight of approx. 2 kg/dm³

3 standard dimensions available:

Art. No.	Type
05 091 002	ST-R 27
05 091 003	ST-R 38
05 091 004	ST-R 45

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Applications!

A few examples:

ROSTA
swinging solutions

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Fax +41 62 889 04 99
E-Mail info@rosta.ch
Internet www.rosta.com

T2014.836

ROSTA Tensioner Devices

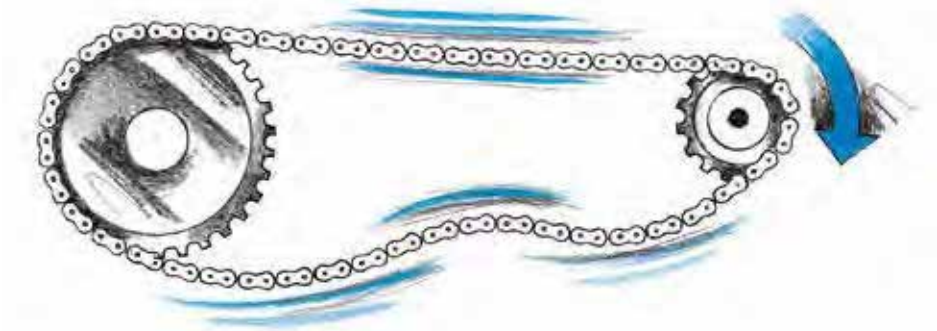
Maintenance-free tensioner systems for belt and chain drives
Easy to install – available in 7 standard sizes – wide range of accessories available

ROSTA
swinging solutions

Customer Benefits from using ROSTA

SE

- Guarantees the lowest possible maintenance outlay
- Is tensioned “for life” (belts)
- Transmits a constant torque
- Gentle belt handling – longer service life

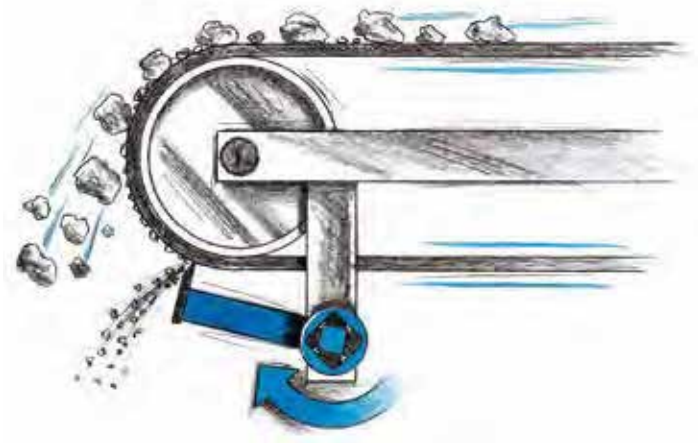


SE-F

- Prevents the polygon effect in the slack side
- Increases the chain contact arc
- Excludes any jumping of the chain links
- Causes the slack side to run tautly and almost silently

SE-W

- Offers continuous contact pressure
- Compensates for wear on the scrapers
- Effectively dampens vibrations in the belt band
- Guarantee for clean conveyor belts



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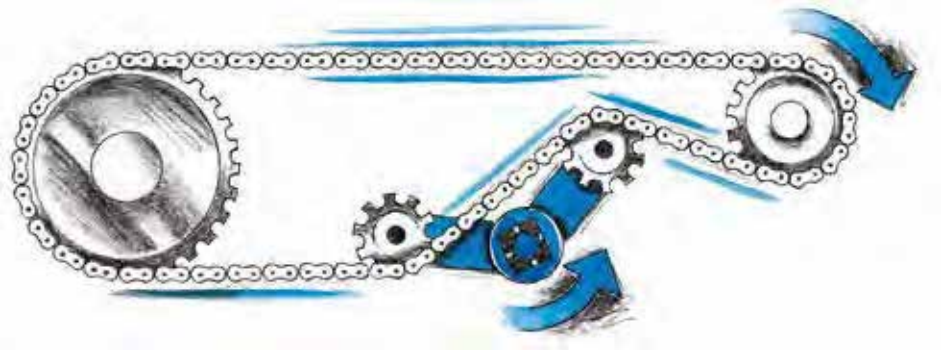
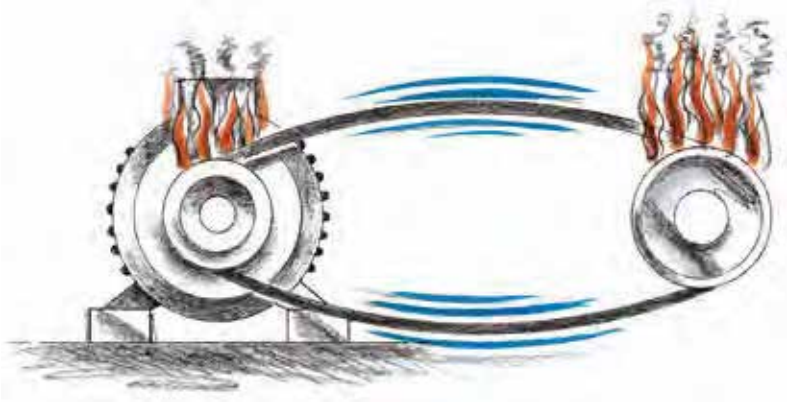
Tensioner Devices in Belt and Chain Drives



- Offers an extremely quiet chain run
- Reduces wear on rollers and bearings
- Effectively dissipates vibrations
- 3-fold slack compensation with “Boomerang®”

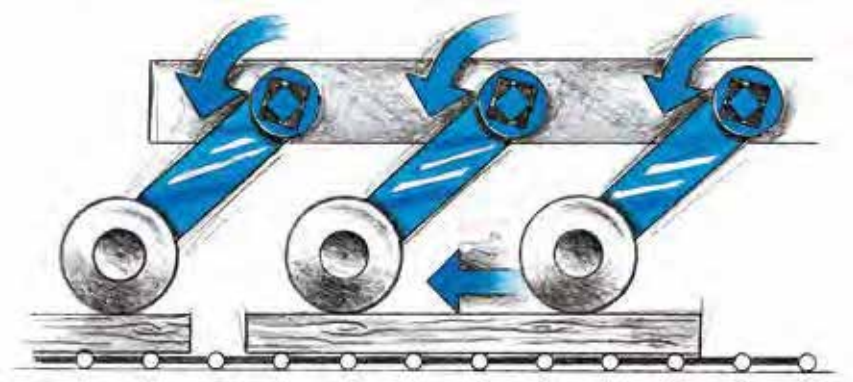
SE-B



- Compensates for belt lengthening
- Prevents excessive slippage and over-heating
- Offers constant torque transfer
- Guarantees longer belt lifetimes

SE-I

- Offers an exactly defined contact pressure
- Accurately transports workpieces
- Maintenance-free and long lasting
- Is a cost-effective alternative to pressure cylinders



SE-G

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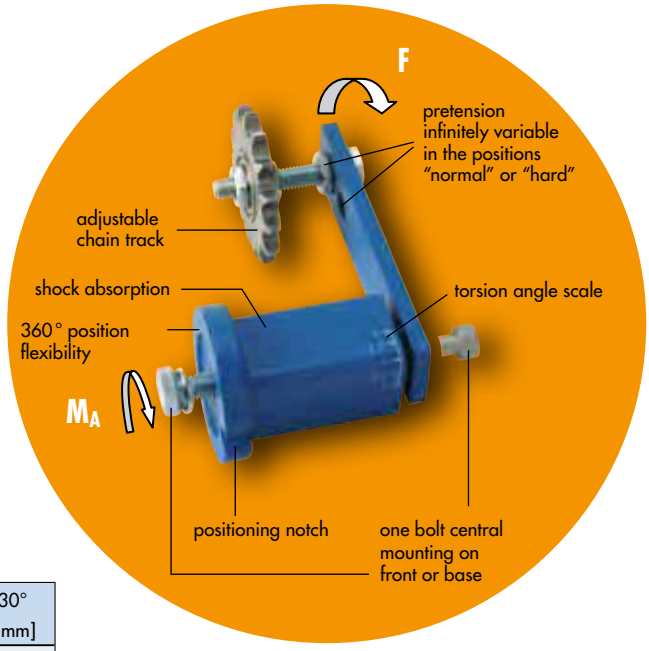
Selection table

	Identification		Characteristics		Working temperature	Details	Illustration
Standard tensioner devices	**SE**	Standard component	Steel parts ROSTA blue painted. Rubber quality Rubmix 10.	Housing and inner core made out of steel.	−40° to +80°C	Page 4.6	
	SE-G	Oil resistant	Steel parts galvanized. Rubber quality Rubmix 20. Marked with yellow dot.		−30° to +90°C	Page 4.6	
	SE-W	Heat resistant	Steel parts ROSTA blue painted. Rubber quality Rubmix 40. Marked with red dot. Tension force 40% less than SE.		+80° to +120°C max.	Page 4.6	
Additional tensioner devices	**SE-R**	Reinforced lever arm	Arm and inner core especially welded for use on combustion engines and compressors. Steel parts ROSTA blue painted. Marked with white ring.	Housing and inner core made out of steel, inserts Rubmix 10.	−40° to +80°C	Page 4.6	
	SE-I	Stainless steel	For the use in food- and pharmaceutic industries. Material: GX5CrNi19-10. Exception: SE-I 40 made out of X5CrNi18-10.			Page 4.6	
	SE-F	Front mounting-device	For installations on blind-hole frames (fixation from the front only). Steel parts ROSTA blue painted. Hex socket screw quality 12.9.			Page 4.7	
	SE-B	Boomerang®	For the tensioning of very long chain and belt drives (triple compensation). Steel parts ROSTA blue painted.			Page 4.7	
Accessories chain drives	**Sprocket wheel set N**		Allows accurate positioning of relevant chain track. Ball-bearings 2Z/C3, permanently lubricated.		−40° to +100°C	Page 4.8	
	Sprocket wheel N						
	Chain rider set P		For double sided use. Max. allowed chain speed 1.5 m/sec. Material: POM-H.		−40° to +100°C	Page 4.9	
	Chain rider P						
Accessories belt drives	**Tensioning roller R**		Material: PA 6. Ball-bearings 2Z/C3, permanently lubricated.		−35° to +100°C	Page 4.10	

Further information to customized elements and installation examples as from page 4.12.

General technology

The ROSTA tensioners should be installed on a stiff, even and clean machine part by means of the central bolt. The frictional connection on flange is usually fully sufficient for final positioning. The positioning notch on flange can be used to assure the tensioner additionally on uneven and dirty surfaces by setting a roller-pin.



Tensioning force F

The tensioning force can be continuously adjusted. The max. pre-tensioning angle is +30° out of neutral position. Tensioning force table for types **SE / SE-G / SE-R / SE-F / SE-I** by using **hole-position "normal"** for sprocket-, rider- and roller fixation.

Size SE	Pre-tension ∢ 10°		Pre-tension ∢ 20°		Pre-tension ∢ 30°	
	F [N]	s [mm]	F [N]	s [mm]	F [N]	s [mm]
11	15	14	40	28	80	40
15	25	17	65	34	135	50
18	75	17	180	34	350	50
27	150	22	380	44	800	65
38	290	30	730	60	1500	87
45	500	39	1300	78	2600	112
50	750	43	2150	86	4200	125

SE-I 40: same tensioning force like SE 38.
SE-W: 40% lower tensioning force than standard versions (Rubmix 40 inserts).

When fixing the sprockets, riders and rollers in arm-position "hard", tensioning force will increase on about 25%.

Tightening moment M_A for attachment screw

Table mentioning the tightening moment for the central screw (included in scope of delivery).

	Quality 8.8	Quality 12.9 only with **SE-F**
M6	10 Nm	17 Nm
M8	25 Nm	41 Nm
M10	49 Nm	83 Nm
M12	86 Nm	145 Nm
M16	210 Nm	355 Nm
M20	410 Nm	690 Nm
M24	750 Nm	

Mounting instructions

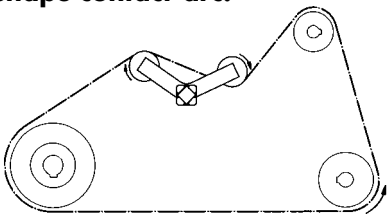
For further mounting instructions please consult the pages 4.9–4.11.

Z-configuration of sprockets or riders

If there is the need to install sprockets, riders or rollers on the outer arm-side of the tensioner, then the distance "Z" should be as little as possible to avoid a misalignment in element parallelism. Furthermore the pre-tension force should not exceed 50% of the capacity = max. pre-tension angle of ~20°.

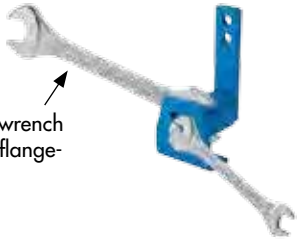
Use of SE-B Boomerang® tensioners

In very long chain and belt drives it was recommendable to install on the slack-side several tensioners, in order to compensate occurring elongation. The "Boomerang" with its bent double-arm equipped with two chain sprockets or a combination of grooved pulley and flat-roller (belt-drives) **offers a triple-compensation of chain and belt elongations, due to S-shape contact-arc.**



Tensioner mounting

Tighten the flange screw slightly. Grip the housing with flat-wrench and set needful pre-tension by rotating the housing in the required direction. Tighten the central screw according the above mentioned tightening moment M_A.



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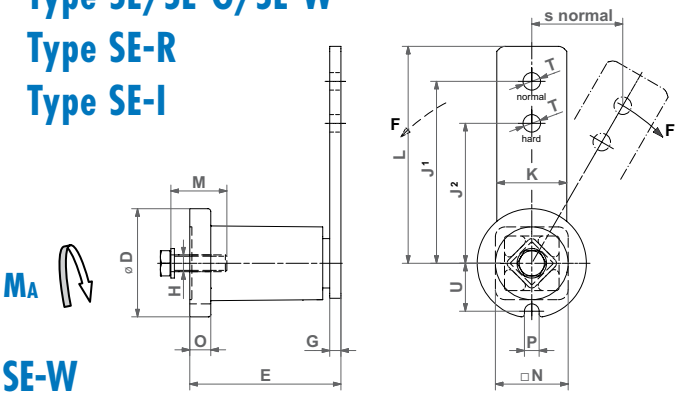
Tensioner Devices

Type SE/SE-G/SE-W
Type SE-R
Type SE-I



Standard Tensioner Devices Types SE / SE-G / SE-W

Type	Art. No.	D	E	G	H	J1	J2	K	L	M	N	O	P	T	U	Weight [kg]
SE 11	**06 011 001**	35	51 $^{+1}_{-0.5}$	5	M6	80	60	20	90	20	22	6	8	8.5	16.5	0.2
SE 11-G	06 013 201															
SE 15	**06 011 002**	45	64 $^{+1}_{-0.5}$	5	M8	100	80	25	112.5	25	30	8	8.5	10.5	20.8	0.4
SE 15-G	06 013 202															
SE 15-W	06 015 002															
SE 18	**06 011 003**	58	79 $^{+1.5}_{-0.5}$	7	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.6
SE 18-G	06 013 203															
SE 18-W	06 015 003															
SE 27	**06 011 004**	78	108 $^{+2}_{-0.5}$	8	M12	130	100	50	155	40	52	15	10.5	12.5	34.3	1.7
SE 27-G	06 013 204															
SE 27-W	06 015 004															
SE 38	**06 011 005**	95	140 $^{+2}_{-0.5}$	10	M16	175	140	60	205	40	66	15	12.5	20.5	42.0	3.6
SE 38-G	06 013 205															
SE 38-W	06 015 005															
SE 45	**06 011 006**	115	200 $^{+3}_{-1}$	12	M20	225	180	70	260	50	80	18	12.5	20.5	52.0	6.4
SE 45-G	06 013 206															
SE 45-W	06 015 006															
SE 50	**06 011 007**	130	210 $^{+3}_{-1}$	20	M24	250	200	80	290	60	87	20	17	20.5	57.5	9.0
SE 50-G	06 013 207															
SE 50-W	06 015 007															

SE-R Tensioning element with strengthened tensioning arm

Type	Art. No.	D	E	G	H	J1	J2	K	L	M	N	O	P	T	U	Weight [kg]
SE-R 15	06 011 702	45	64 $^{+1}_{-0.5}$	5	M8	100	80	25	112.5	25	30	8	8.5	10.5	20.8	0.4
SE-R 18	06 011 703	58	79 $^{+1.5}_{-0.5}$	7	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.6

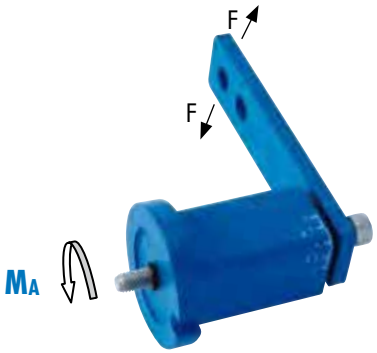
SE-I Tensioning element made out of stainless steel, INOX

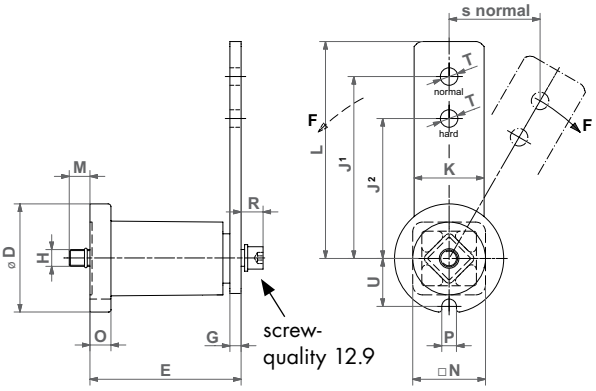
Type	Art. No.	D	E	G	H	J1	J2	K	L	M	N	O	P	T	U	Weight [kg]
SE-I 15	06 071 111	45	64 $^{+1}_{-0.5}$	5	M8	100	80	25	112.5	25	30	8	8.5	10.5	20.8	0.4
SE-I 18	06 071 112	58	79 $^{+1.5}_{-0.5}$	7	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.7
SE-I 27	06 071 113	78	108 $^{+2}_{-0.5}$	8	M12	130	100	50	155	40	52	15	10.5	12.5	34.3	2.1
SE-I 40	06 071 104	100	140 $^{+2}_{-0.5}$	10	M16	175	140	70	205	40	70	15	12	20.5	41.5	3.8

Further product and performance datas on pages 4.4–4.5.

Tensioner Devices

Type SE-F

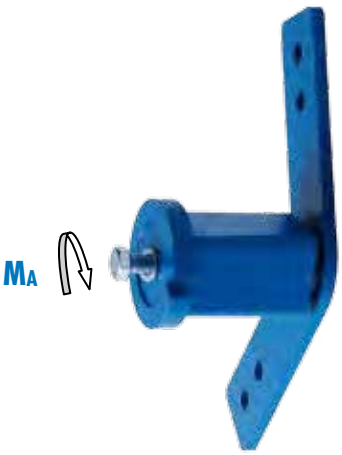


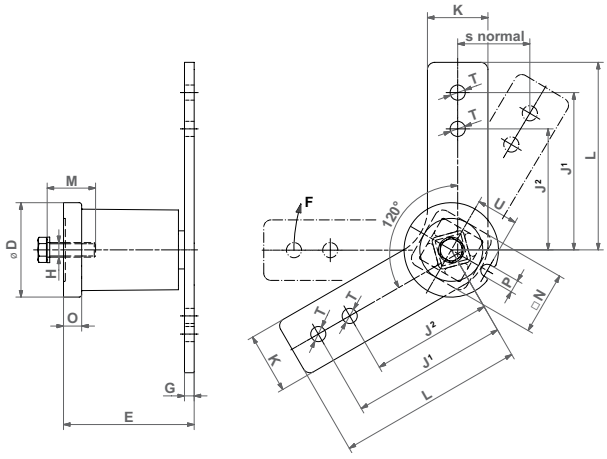


Tensioning element with front mounting

Type	Art. No.	D	E	G	H	J1	J2	K	L	M ca.	N	O	P	R	T	U	Weight [kg]
SE-F 15	06 061 002	45	64 $^{+1}_{-0.5}$	5	M6	100	80	25	112.5	12	30	8	8.5	10	10.5	20.8	0.4
SE-F 18	06 061 003	58	79 $^{+1.5}_{-0.5}$	7	M8	100	80	30	115	18	35	10.5	8.5	11	10.5	25.3	0.7
SE-F 27	06 061 004	78	108 $^{+2}_{-0.5}$	8	M10	130	100	50	155	17	52	15	10.5	15	12.5	34.3	1.9
SE-F 38	06 061 005	95	140 $^{+2}_{-0.5}$	10	M12	175	140	60	205	16	66	15	12.5	17	20.5	42.0	3.7
SE-F 45	06 061 006	115	200 $^{+3}_{-1}$	12	M16	225	180	70	260	32	80	18	12.5	24	20.5	52.0	6.9
SE-F 50	06 061 007	130	210 $^{+3}_{-1}$	20	M20	250	200	80	290	23	87	20	17	27	20.5	57.5	10.1

Type SE-B Boomerang ®





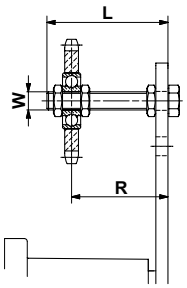
Type	Art. No.	D	E	G	H	J1	J2	K	L	M	N	O	P	T	U	Weight [kg]
SE-B 18	06 021 003	58	78 $^{+1.5}_{-0.5}$	6	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.8
SE-B 27	06 021 004	78	108 $^{+2}_{-0.5}$	8	M12	130	100	50	155	40	52	15	10.5	12.5	34.3	2.1

Further product and performance datas on pages 4.4–4.5.

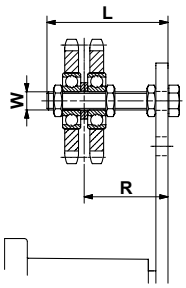
Sprocket wheel set type N

Sprocket wheel type N

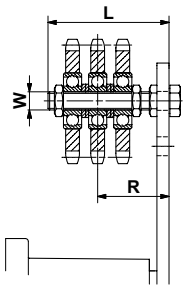
Simplex "S"



Duplex "D"



Triplex "T"

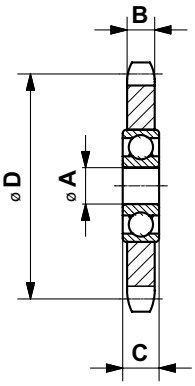


Sprocket wheel set type N

Rollerchain ANSI	Rollerchain DIN 8187	Type	Art. No.	Number of teeth	W	L	Torque hex nut 0.5 d [Nm]	Adjusting range track R	Size SE	Weight [kg]
Simplex "S"										
35	ISO 06 B-1	N3/8"–10 S	06 510 001	15	M10	55	20	22–43 / 23–43	15 / 18	0.15
40	ISO 08 B-1	N1/2"–10 S	06 510 002	15	M10	55	20	23–44	18	0.20
50	ISO 10 B-1	N5/8"–12 S	06 510 003	15	M12	80	35	27–65	27	0.35
60	ISO 12 B-1	N3/4"–12 S	06 510 004	15	M12	80	35	27–65	27	0.55
60	ISO 12 B-1	N3/4"–20 S	06 510 005	15	M20	100	172	40–80	38	0.85
80	ISO 16 B-1	N1"–20 S	06 510 006	13	M20	100	172	40–80	38	1.25
100	ISO 20 B-1	N1 1/4"–20 S	06 510 007	13	M20	100	172	40–80 / 48–80	45 / 50	2.00
120	ISO 24 B-1	N1 1/2"–20 S	06 510 008	11	M20	140	172	40–120 / 48–120	45 / 50	2.35
Duplex "D"										
35	ISO 06 B-2	N3/8"–10 D	06 520 001	15	M10	55	20	27–39 / 28–39	15 / 18	2.00
40	ISO 08 B-2	N1/2"–10 D	06 520 002	15	M10	55	20	30–37	18	0.35
50	ISO 10 B-2	N5/8"–12 D	06 520 003	15	M12	80	35	36–57	27	0.60
60	ISO 12 B-2	N3/4"–12 D	06 520 004	15	M12	80	35	37–56	27	1.05
60	ISO 12 B-2	N3/4"–20 D	06 520 005	15	M20	120	172	50–90	38	1.35
80	ISO 16 B-2	N1"–20 D	06 520 006	13	M20	120	172	55–84	38	2.10
100	ISO 20 B-2	N1 1/4"–20 D	06 520 007	13	M20	140	172	60–102 / 68–102	45 / 50	3.60
120	ISO 24 B-2	N1 1/2"–20 D	06 520 008	11	M20	140	172	65–97 / 73–97	45 / 50	4.25
Triplex "T"										
35	ISO 06 B-3	N3/8"–10 T	06 530 001	15	M10	70	20	33–48	18	0.25
40	ISO 08 B-3	N1/2"–12 T	06 530 002	15	M12	80	35	41–51	27	0.50
50	ISO 10 B-3	N5/8"–12 T	06 530 003	15	M12	80	35	43–50	27	0.95
50	ISO 10 B-3	N5/8"–20 T	06 530 004	15	M20	120	172	56–84	38	1.25
60	ISO 12 B-3	N3/4"–20 T	06 530 005	15	M20	120	172	59–80	38	1.50
80	ISO 16 B-3	N1"–20 T	06 530 006	13	M20	160	172	74–108	45	2.90
100	ISO 20 B-3	N1 1/4"–20 T	06 530 007	13	M20	160	172	78–105 / 86–105	45 / 50	5.20
120	ISO 24 B-3	N1 1/2"–20 T	06 530 008	11	M20	180	172	90–111 / 98–111	45 / 50	6.20

Sprocket wheel type N

Roller chain ANSI	Roller chain DIN 8187	Type	Art. No.	Number of teeth	A	B	C	D	Weight [kg]
35	ISO 06 B	N3/8"–10	06 500 001	15	10	5.3	9	45.81	0.06
40	ISO 08 B	N1/2"–10	06 500 002	15	10	7.2	9	61.08	0.15
40	ISO 08 B	N1/2"–12	06 500 003	15	12	7.2	12	61.08	0.15
50	ISO 10 B	N5/8"–12	06 500 004	15	12	9.1	12	76.36	0.27
50	ISO 10 B	N5/8"–20	06 500 005	15	20	9.1	15	76.36	0.29
60	ISO 12 B	N3/4"–12	06 500 006	15	12	11.1	12	91.63	0.47
60	ISO 12 B	N3/4"–20	06 500 007	15	20	11.1	15	91.63	0.47
80	ISO 16 B	N1"–20	06 500 008	13	20	16.1	15	106.14	0.88
100	ISO 20 B	N1 1/4"–20	06 500 009	13	20	18.5	15	132.67	1.60
120	ISO 24 B	N1 1/2"–20	06 500 010	11	20	24.1	15	135.23	1.93

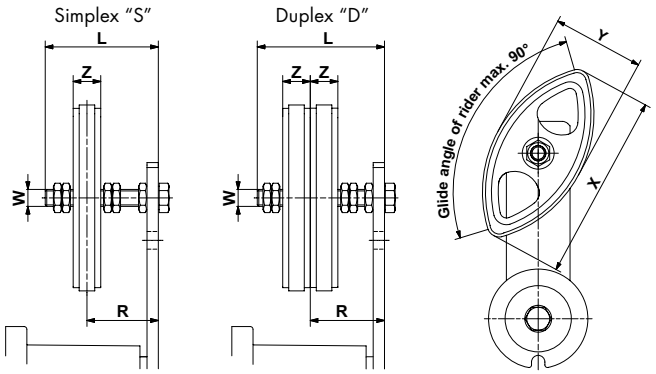


Chain Drives

Chain rider set type P

Chain rider type P

For an ideal positioning of the chain rider/s on the threaded rod we do recommend to position them on each side by means of two nuts, secured against each other, with some play for swivelling into working position.

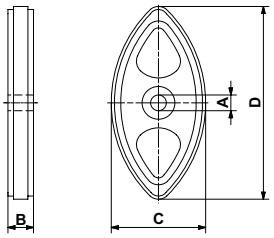


Chain rider set type P

Roller chain ANSI	Roller chain DIN 8187	Type	Art. No.	W	L	X	Y	Z	Torque hex nut 0.5d [Nm]	Adjusting range track R	Size SE	Weight [kg]
Simplex "S"												
35	ISO 06 B-1	P3/8"– 8 S	06 550 001	M8	45	74	37	10.2	11	19–34	11	0.05
40	ISO 08 B-1	P1/2"–10 S	06 550 002	M10	55	96	48	13.9	20	23–41	15/18	0.10
50	ISO 10 B-1	P5/8"–10 S	06 550 003	M10	55	126	63	16.6	20	24–39	18	0.12
60	ISO 12 B-1	P3/4"–12 S	06 550 004	M12	80	148	72	19.5	35	30–61	27	0.18
Duplex "D"												
35	ISO 06 B-2	P3/8"– 8 D	06 560 001	M8	45	74	37	10.2	11	25–30	11	0.07
40	ISO 08 B-2	P1/2"–10 D	06 560 002	M10	55	96	48	13.9	20	30–34	15/18	0.12
50	ISO 10 B-2	P5/8"–10 D	06 560 003	M10	70	126	63	16.6	20	34–46	18	0.17
60	ISO 12 B-2	P3/4"–12 D	06 560 004	M12	80	148	72	19.5	35	40–52	27	0.26

Chain rider type P

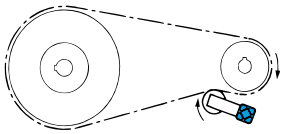
Roller chain ANSI	Roller chain DIN 8187	Type	Art. No.	A $^{+0.2}_{0}$	B	C	D	Weight [kg]
35	ISO 06 B	P3/8"	06 540 001	8	10.2	37	74	0.02
40	ISO 08 B	P1/2"	06 540 002	10	13.9	48	96	0.03
50	ISO 10 B	P5/8"	06 540 003	10	16.6	63	126	0.05
60	ISO 12 B	P3/4"	06 540 004	12	19.5	72	148	0.07



Mounting instructions for Chain Drives

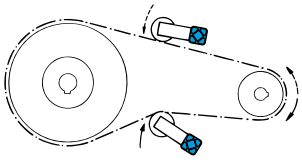
See also complementary mounting instructions on page 4.5.

Standard positioning



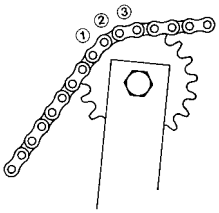
The ROSTA tensioning device should be placed on the slack-side of the chain drive, close by the smaller sprocket wheel in order to enlarge its contact-arc, therefore contact application from outer side of drive. In mounted position the tensioner-arm should stay close to parallel to the chain run, in drain direction. By extremely long chain drives it is recommendable to install several tensioners or the type "Boomerang®" in order to enlarge the slack compensation.

Reversible chain drive



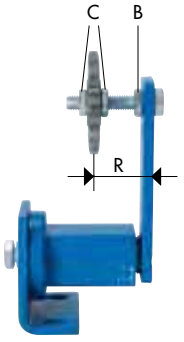
By reversible chain transmissions it is recommendable to install a tensioner on each side of the chain-strands. Due to the alternate occurring of the slack, both tensioners should only be pre-tensioned up to max. 20°, in order to retain a reset-path of 10°, when strains are changing from slack span on working span in reversible applications.

Sprocket teeth in mesh



By the initial tensioning of the chain at least three teeth of the tensioner sprocket wheel should be in mesh with the rollers. The min. distance between sprocket wheel of the tensioner to the next sprocket wheel in the chain drive should be at least four chain-pitches.

Adjustment of chain-track



The wheel of the sprocket wheel set is adjustable according to the position of the chain drive track. The wheel is positioned between two nuts on the threaded shaft. In changing the adjustment band "R", the track of the tensioner wheel can be set according to relevant strand course. After positioning of sprocket, re-tighten the two nuts on the side. The counter-nut "B" remains always tightened.

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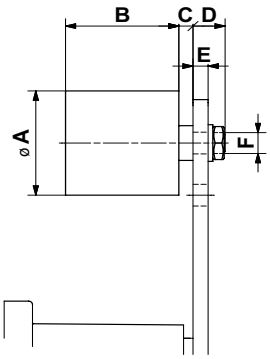
Accessories belt drives

Tensioning roller Type R



Type	Art. No.	Max. speed [rpm]	Max. belt width	A	B	C	D	E max.	F	Torque hex nut [Nm]	Size SE	Weight [kg]
R 11	06 580 001	8000	30	30	35	2	14	5	M8	20	11	0.08
R 15/18	06 580 002	8000	40	40	45	6	16	7	M10	20	15/18	0.17
R 27	06 580 003	6000	55	60	60	8	17	8	M12	35	27	0.40
R 38	06 580 004	5000	85	80	90	8	25	10	M20	160	38	1.15
R 45	06 580 005	4500	130	90	135	10	27	12	M20	160	45	1.75

Instructions for belt drives

a) Selection of the adequate ROSTA Tensioner size

Selection table mentioning the most conventional V-belt types.

V-belt type	Width [mm]	Height [mm]	Diam. of smaller pulley [mm]	Initial operation test-force F_I** [N]	Operational test-force F_O** [N]	Size SE* (without SE-W and SE-B)				
						1 belt	2 belts	3 belts	4 belts	5 belts
XPZ, SPZ	10	8	56–71	20	16	11	18	18	18	18
			75–90	22	18	11	18	18	18	27
			95–125	25	20	15	18	18	18	27
			≥ 125	28	22	15	18	18	27	27
XPA, SPA	13	10	80–100	28	22	15	18	18	27	27
			106–140	38	30	15	18	27	27	27
			150–200	45	36	18	18	27	27	27
			≥ 200	50	40	18	18	27	27	38
XPB, SPB	16	13	112–160	50	40	18	18	27	27	38
			170–224	62	50	18	27	27	38	38
			236–355	77	62	18	27	38	38	38
			≥ 355	81	65	18	27	38	38	38
XPC, SPC	22	18	224–250	87	70	18	27	38	38	38
			265–355	115	92	27	38	38	45	45
			≥ 375	144	115	27	38	38	45	45
Z	10	6	56–100	5–7.5		11	11	11	15	15
A	13	8	80–140	10–15		11	15	18	18	18
B	17	10	125–200	20–30		15	18	18	27	27
C	22	12	200–400	40–60		18	27	27	38	38
D	32	19	355–600	70–105		18	27	38	38	45

* General basic selection criteria:

F resulting tensioning force by a pre-tension angle of 20° (see table page 4.5)

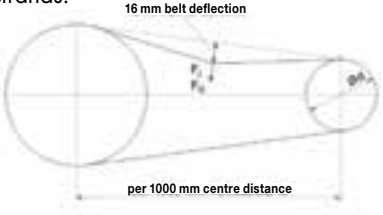
F_I initial operation test-force according guidelines of the belt manufacturer

z quantity of belts in drive

2 multiplier for the compensation of belt-slippage and/or of centrifugal force generated on belt strands.

$$F = F_I \cdot z \cdot 2$$

** required test-force for belt deflection of 16 mm per 1000 mm of centre distance.
The relevant deflection by shorter or longer centre distance has to be interpolated accordingly.



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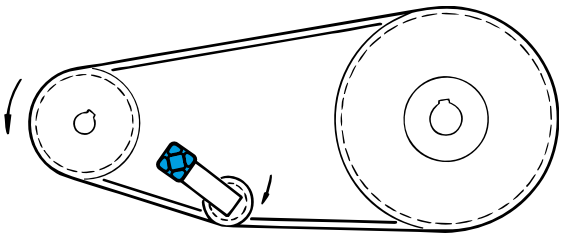
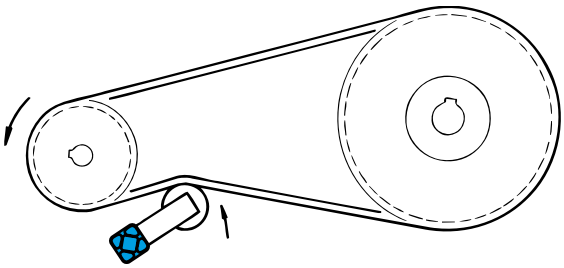
b) Modalities of tensioning

See also complementary mounting instructions on page 4.5.



Tensioning from "inside" of the belt drive with grooved pulley

– Installation in slack span of the belt drive, make sure that the belts are maintaining sufficient contact-arc on the driver- and driven-pulley.
– By extremely long centre distances between driver and driven pulley it is recommendable to use on the tensioner a deep-grooved pulley to avoid excessive slack beating.



Tensioning with flat roller on belt back

– The diameter of the flat tensioning roller should at least measure $^2/_3$ of the diameter of the smallest pulley in the drive.
– The width of the tensioning roller should be at least 20% wider than the overall width of the belt set.
– Installation on the belt back in the slack span, make sure that the belts are maintaining sufficient contact-arc on the driver and driven pulley.

c) Control procedure for checking belt tension

Proceed according to the mentioned guidelines on page 4.5 and 4.10–4.11.

There are several instruments for checking with the adequate test-force the right tension on your frictional V-belt drive. **Don't make it with your thumb, you will make an estimation mistake and your belts will wear out prematurely!**

Optikrik-tester from **Optibelt**

Spring scale tester from **Gates**

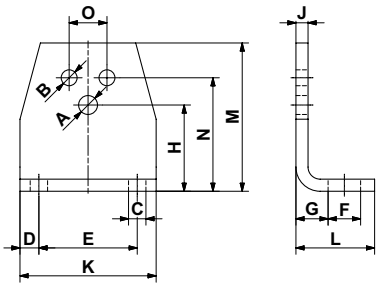
Infrared-frequency tester

Re-tension of belts: Generally, there is no re-tension maintenance service required, however we would recommend to check the test-force after some days of running-in with the required operational test-force (see table page 4.10).

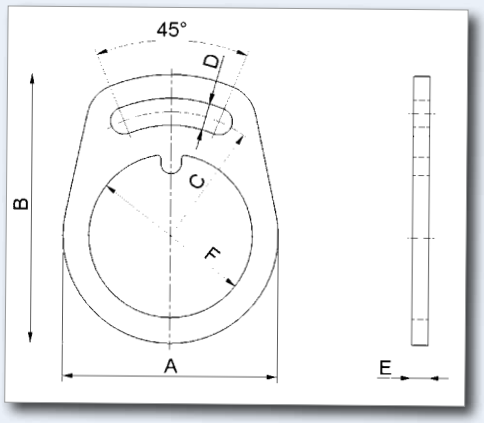
ROSTA Tensioner Devices and Accessories to meet individual customer requirements

Support bracket type WS

For the easy mounting of all standardized ROSTA Tensioners (except SE 50).



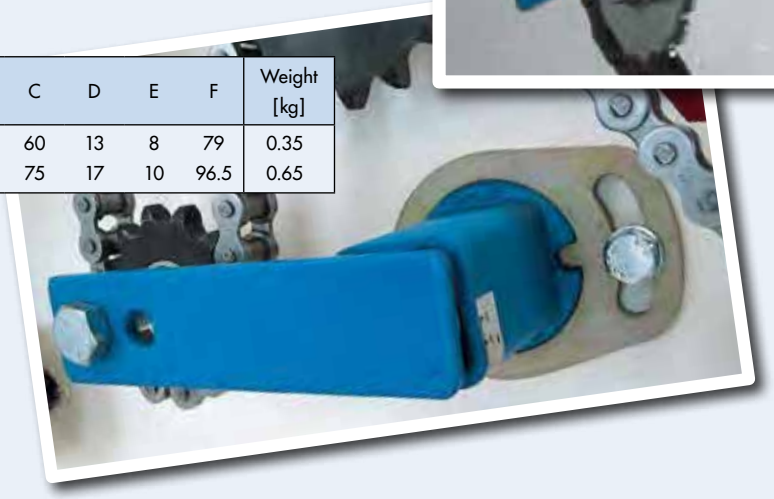
Type	Art. No.	suitable to Size SE	A	B	C	D	E	F	G	H	J	K	L	M	N	O	Weight [kg]
WS 11	06 590 001	11	6.5	5.5	7	7.5	30	13	11.5	27	4	45	30	46	35	10	0.08
WS 15	06 590 002	15	8.5	6.5	7	7.5	40	13	13.5	34	5	55	32	58	44	12	0.15
WS 18	06 590 003	18	10.5	8.5	9.5	10	50	15.5	16.5	43	6	70	38	74	55	20	0.28
WS 27	06 590 004	27	12.5	10.5	11.5	12.5	65	21.5	21	57	8	90	52	98	75	25	0.70
WS 38	06 590 005	38	16.5	12.5	14	15	80	24	21	66	8	110	55	116	85	35	0.90
WS 45	06 590 006	45	20.5	12.5	18	20	100	30	26	80	10	140	66	140	110	40	1.80



Safety Sockets SS 27 and SS 38

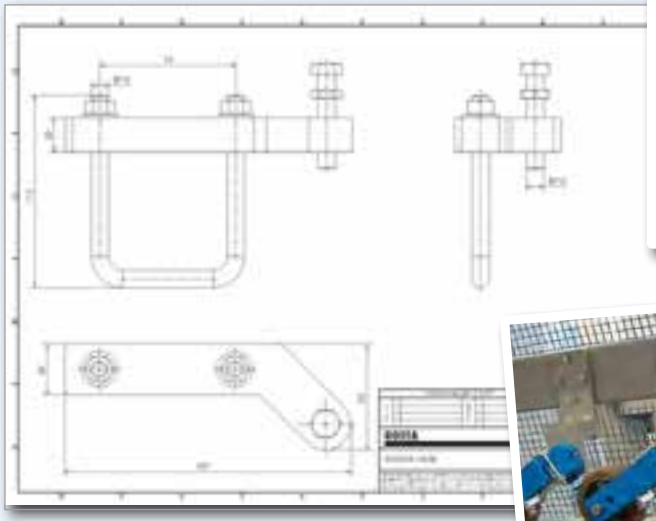
By uneven surfaces and/or by paint coatings, which are giving insufficient friction locking, the positioning and further re-tensioning can be made with these standardized Safety Sockets.

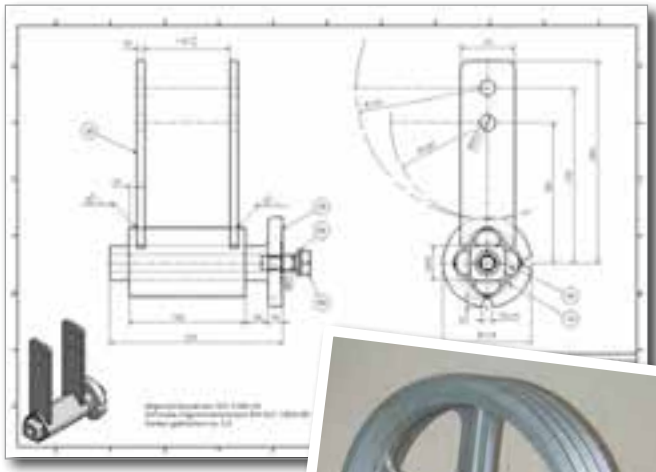
Type	Art. No.	suitable to Size SE	A	B	C	D	E	F	Weight [kg]
SS 27	06 618 400	27	104	130	60	13	8	79	0.35
SS 38	06 618 394	38	128	161	75	17	10	96.5	0.65



Guide roller suspensions with tensioners SE and pre-tensioning devices VS

For the accurate definition of the required pre-tension and limitation of the roller travel we do recommend the use of our pre-tensioning clamp VS allowing angle adjustments from 0–15° (for all SE-sizes available).





DAT (Double Arm Tensioner)

For the transfer of very high tension-forces we do recommend to use this double arm tensioner, avoiding any misalignment or fault of parallelism between tensioner housing and inner square-core-generating belt eating angular off-set of the tensioning pulley.

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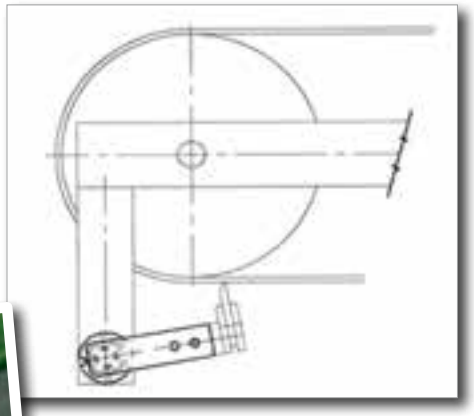
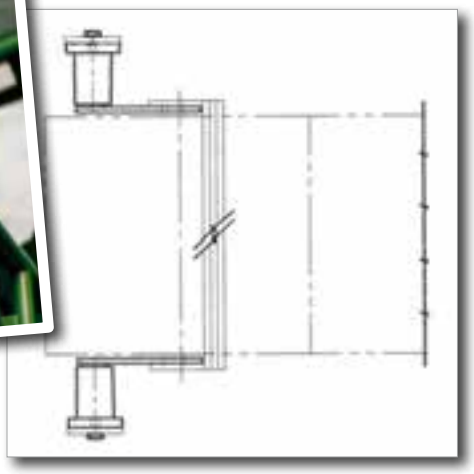
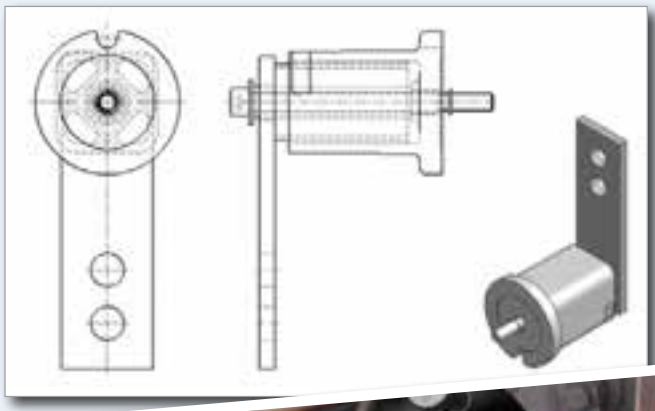
Elastic suspension of conveyor belt scrapers with tensioner devices SE

The ROSTA suspension is offering continuous and wear compensating cleaning pressure on conveyor belt scrapers to abrade small particle sizes.
For belt widths:

- 400–600 mm = 2 units **SE 18**
- 600–800 mm = 2 units **SE 27**
- 800–1000 mm = 2 units **SE 38**
- 1000–1300 mm = 2 units **SE 45**







ROSTA Tensioner Devices type SE-F (W) 38 for the Bus Industries

Today, nearly all busses for passenger transport are equipped with an air-conditioning system.

The Diesel engine of the bus serves thereby as energy source of the cooling compressor. The piston- or rotation compressors are driven via V- or Poly-V-belts from the spur wheel of the main engine. This belt transmission requires a slippage-free power train to ensure the full capacity of the cooling compressors.

ROSTA designed for this specific application a heat resistant tensioner – powerful, compact with a long compensation travel.

Different versions available. Please do not hesitate to contact ROSTA directly.

Packaging units for Distribution and large-scale Consumers

Please select the protecting, stackable and discount-priced packaging units for the ROSTA standard tensioner devices type SE.

Quantity per box:

SE 11	=	30 pieces
SE 15	=	20 pieces
SE 18	=	15 pieces
SE 27	=	10 pieces

ROSTA belt and chain tensioners ...
... a success story!

In the year 1961, a foreman at ROSTA AG became annoyed about the tedious and ever recurring re-tensioning of the belt on a large ventilator. Without a moment's hesitation, he sawed an old ROSTA rubber suspension axle in two and fitted a tension roller onto the lever arm – the automatic belt tensioner was born. People at ROSTA AG were very happy about this "invention" by the foreman – but it took a full 2 years before the owner of the company had the idea of commercialising this application, and of offering standardized chain and belt tensioners worldwide.

These simple, maintenance-free and automatic re-tensioning ROSTA machine components very quickly became established in general machinery and system construction, and, thanks to good marketing, demand from all over the world increased rapidly. Even today, several hundred thousands of these **blue** tensioning elements are being manufactured at ROSTA AG and by two licensees every year.

Original ROSTA belt and chain tensioners – often copied but never matched!

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Strained Applications!

A few examples:

ROSTA
swinging solutions

ROSTA AG
CH-5502 Hunzenschwil
Phone +41 62 889 04 00
Fax +41 62 889 04 99
E-Mail info@rosta.ch
Internet www.rosta.com

T2014.837

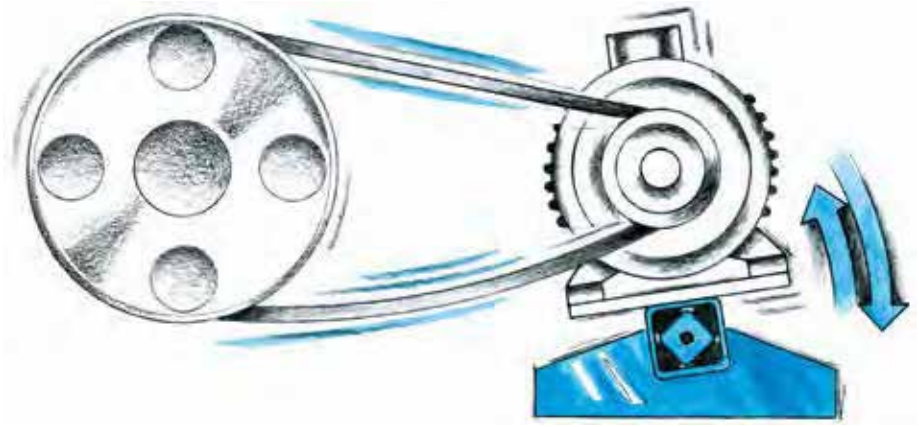
ROSTA Motorbases

Self-tensioning Motor Mounts for all Friction Belt Drives
slippage-free – belt protecting – maintenance-free

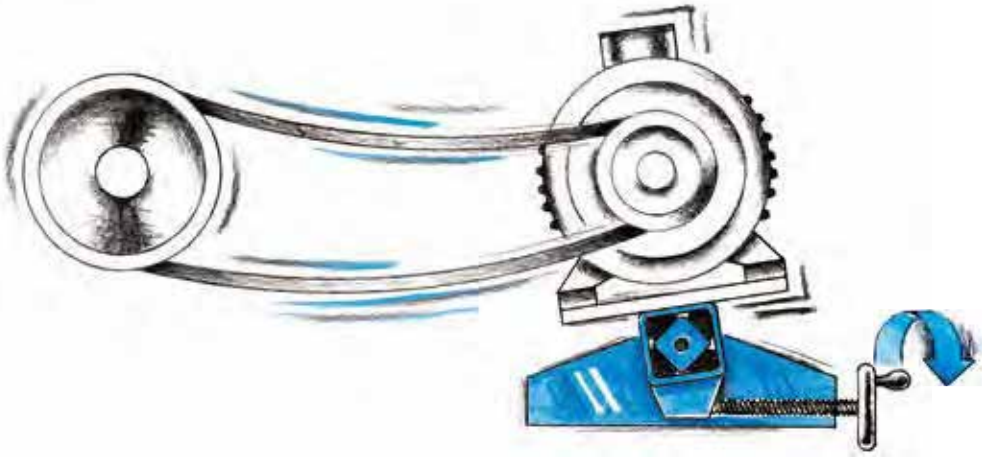
ROSTA
swinging solutions

Customer Benefits of the ROSTA

MB 27



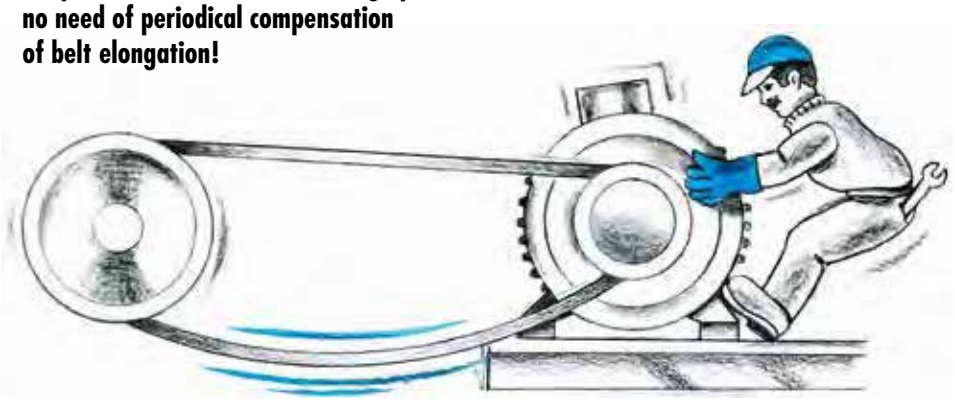
Offers short-term slippage by the start-up of large inertias, avoiding excessive tension on belt-carcass!



Offers fast belt changing, no need of complex readjustment of the pulleys!

MB 38

Fully maintenance-free tensioning system, no need of periodical compensation of belt elongation!



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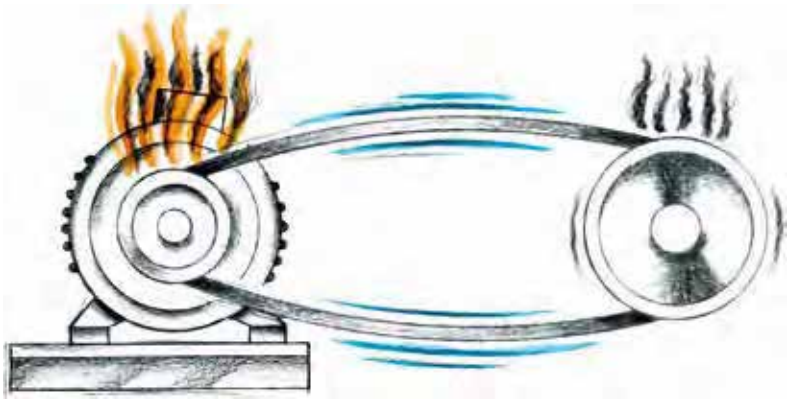
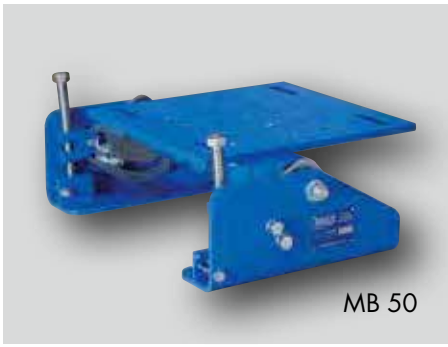
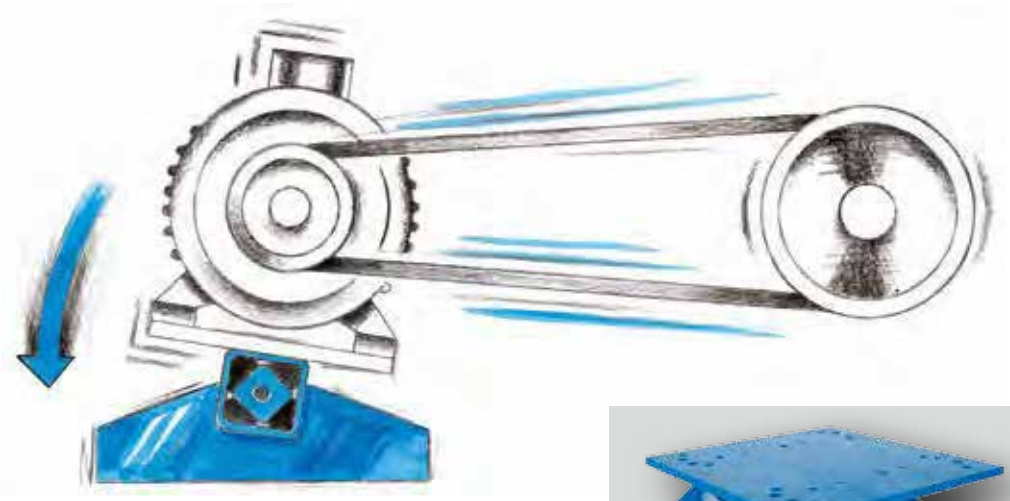
Motorbases in Friction Belt Drives



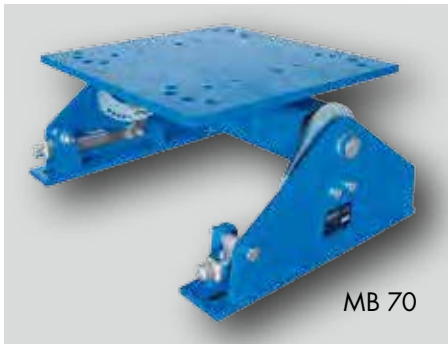


MB 50

**Prevents from slack accruement,
avoids heat generating slippage of the belts
and averts from premature belt failure!**

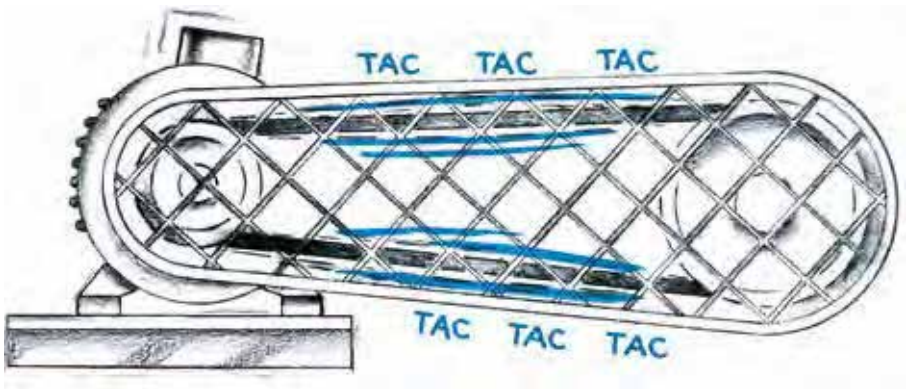


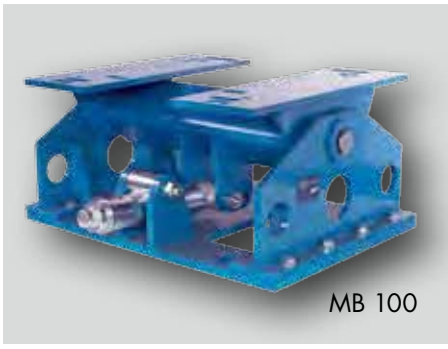
**Offers ideal belt tension,
constant transmission of nominal torque,
less energy consumption,
can lead to threefold belt lifetime!**



MB 70

**Noiseless power transmission,
all time ideally tightened belt sets!**





MB 100

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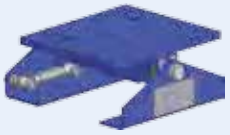
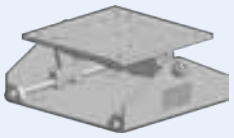
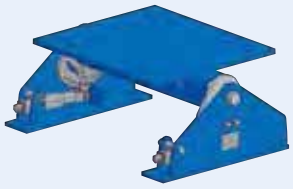
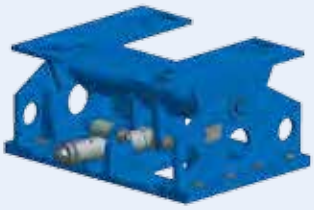
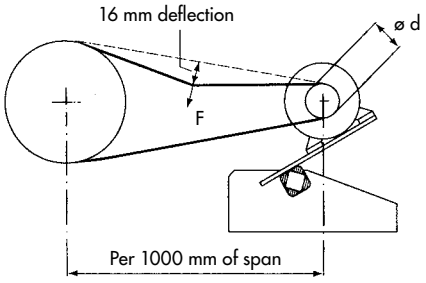
Selection table of **ROSTA** Motorbases according to the motor frame sizes

IEC			NEMA			Type of Motorbase	Details	Standard Design
Motor Frame Size	P [kW] 1000 min^{-1} 6-pole motor	P [kW] 1500 min^{-1} 4-pole motor	Motor Frame Size	P [HP] 1200 min^{-1} 6-pole motor	P [HP] 1800 min^{-1} 4-pole motor			
90S 90L	0.75 1.1	1.1 1.5	143T 145T	0.75 1	1 1.5 / 2	**MB 27×120**	Pages 5.6–5.7	MB 27 
100L	1.5	2.2 / 3	182T	1.5	3			
112M	2.2	4	184T	2	5			
132S 132M	3 4 / 5.5	5.5 7.5	213T 215T	3 5	7.5 10	**MB 38×300**	Pages 5.6–5.7	MB 38 
160M 160L	7.5 11	11 15	254T 256T	7.5 10	15 20			
160M 160L	7.5 11	11 15	254T 256T	7.5 10	15 20	**MB 50×270-1**	Pages 5.8–5.9	MB 50 
180M 180L	– 15	18.5 22	284T 286T	15 20	25 30	**MB 50×270-2**		
200L	18.5 / 22	30	324T 326T	25 30	40 50	**MB 50×400**		
225S 225M	– 30	37 45	364T 365T	40 50	60 75	**MB 50×500**		
250M	37	55	404T	60	100	**MB 70×400**	Pages 5.10–5.11	MB 70 
280S 280M	45 55	75 90	405T 444T	75 100	100 / 125 125 / 150	**MB 70×550**		
315S	75	110	445T	125 / 150	150 / 200	**MB 70×650**		
315M 315L	90 / 110 110–160	132–160 160–200	447T 449T	150–200 200–300	200–250 250–300	**MB 70×800**		
315M 315L	90 / 110 110–160	132–160 160–200	447T 449T	150–200 200–300	200–250 250–300	**MB 100×750**	Pages 5.12–5.13	MB 100 
355S 355M 355L	132–160 200–250 200–250	200–250 250 250	586/7	250–350	300–350			

Directions regarding customized designs of motorbases on pages 5.14–5.15.
In case of possibly not mentioned motor frame sizes, please contact **ROSTA**.

Test forces for ideal belt tensioning

The ROSTA Motorbase is offering with its mechanical pretensioning device the ideal calibration of the relevant belt tension, based on the test force recommendations of the belt suppliers. These recommended test forces for the most common V-belt sizes are mentioned in the test force table on the right.



Exception

For screen applications the belt only tighten enough that they do not slip during start-up and operation.

Test force table by initial V-belt installation

(standard values for the most common types of V-belts)

V-belt type	Width [mm]	Height [mm]	Diam. of smaller pulley [mm]	Initial operation test-force F_I* [N]	Operational test-force F_O* [N]
XPZ, SPZ	10	8	56–71	20	16
			75–90	22	18
			95–125	25	20
			≥ 125	28	22
XPA, SPA	13	10	80–100	28	22
			106–140	38	30
			150–200	45	36
			≥ 200	50	40
XPB, SPB	16	13	112–160	50	40
			170–224	62	50
			236–355	77	62
			≥ 355	81	65
XPC, SPC	22	18	224–250	87	70
			265–355	115	92
			≥ 375	144	115
Z	10	6	56–100	5–7.5	
A	13	8	80–140	10–15	
B	17	10	125–200	20–30	
C	22	12	200–400	40–60	
D	32	19	355–600	70–105	

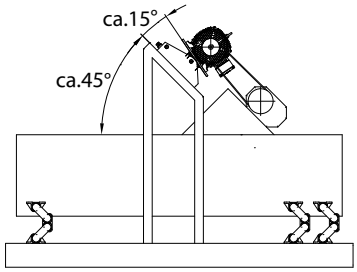
* Test force for V-belts. By ideal belt tensioning a deflection of 16 mm per 1000 mm pulley center distance shall occur. (By shorter or longer span, the value 16 mm has to be interpolated.)

Usual positioning of the ROSTA Motorbase

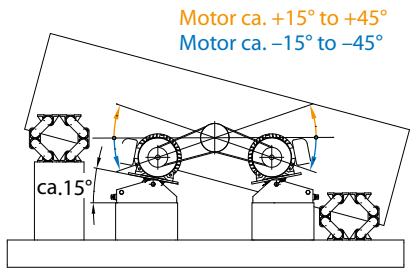
These recommendations are based on practical experience, a test run will show the ideal adjustment.

Screen drive applications

„Overhead" Configuration

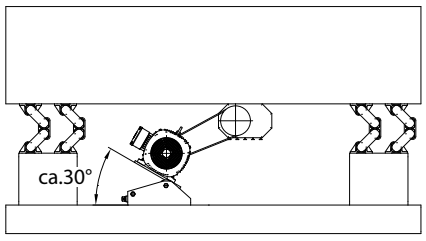


„Along-Side" Configuration



„Foot-Mounting" Configuration, Feeder

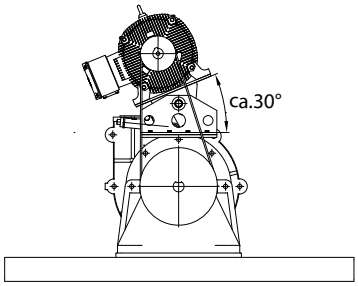
Extended "off-set" and larger Motorbase size recommended.



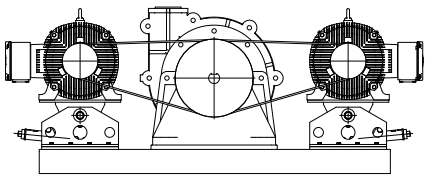
Pump drive applications

„Overhead" Configuration

Motor plate „off-set", towards the pretensioning device.



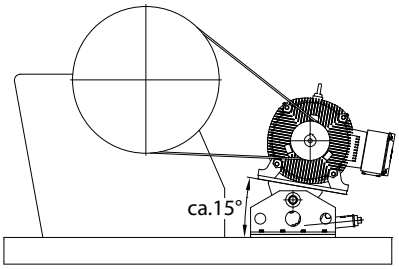
„Along-Side" Configuration



Crusher applications

Variable Loads

Motor plate „off-set", towards the pretensioning device.



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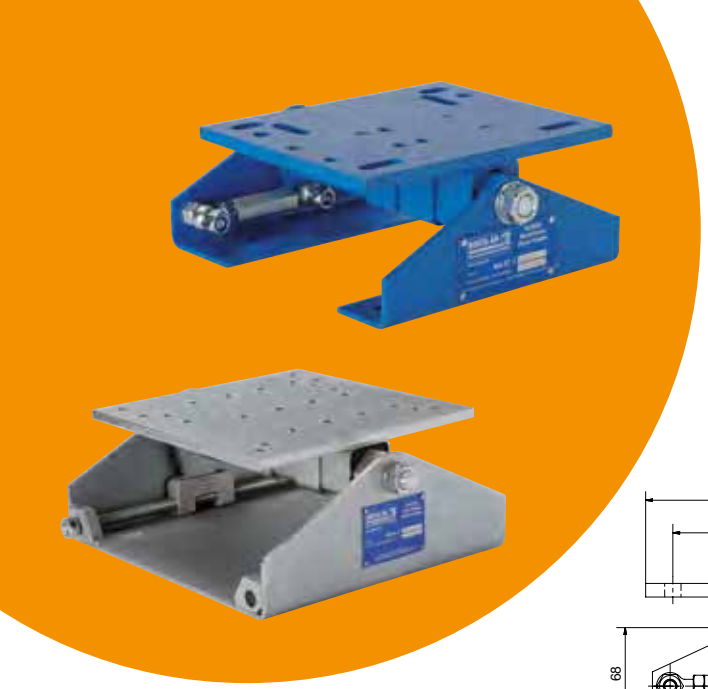
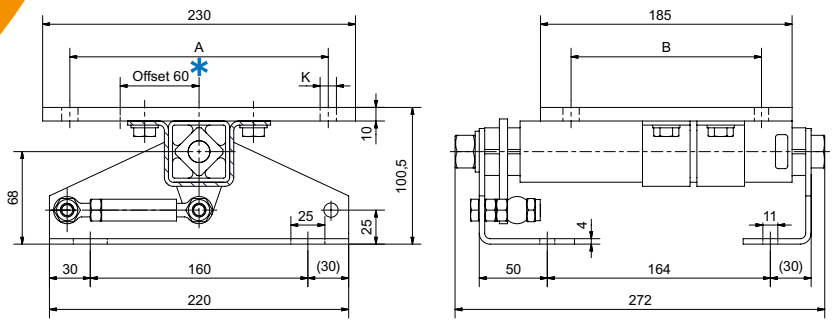
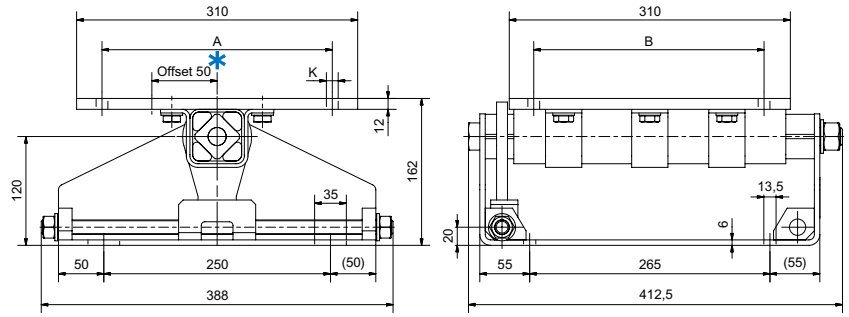


Motorbases
Type MB 27
Type MB 38

MB 27 × 120



MB 38 × 300

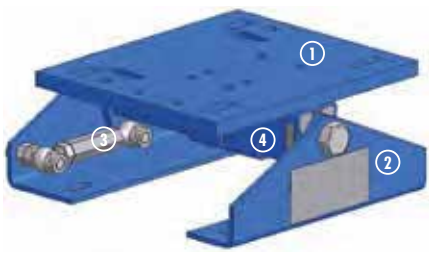


Art. No.	Type	IEC				NEMA				Weight [kg]
		Motor Frame Size	A	B	K	Motor Frame Size	A	B	K	
02 200 201	**MB27 × 120**	90S 90L	140 140	100 125	10.5 10.5	143T 145T	140 140	102 127	10.5 10.5	8
		100L	160	140	10.5	182T	190	114	10.5	
		112M	190	140	10.5	184T	190	140	10.5	
02 000 301	**MB38 × 300**	132S 132M	216 216	140 178	M10 M10	213T 215T	216 216	140 178	M10 M10	26
		160M 160L	254 254	210 254	13 13	254T 256T	254 254	210 254	13 13	

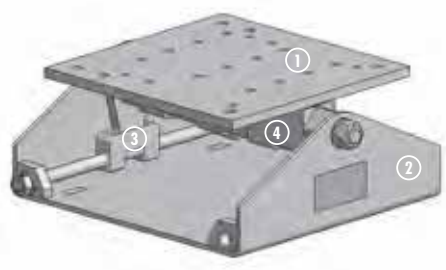
Details regarding special designs, see pages 5.14–5.15.

* Is the resulting tension-travel of the motorbase not effectual, we recommend to position the motor plate in “off-set” configuration, offering enlarged compensation travel.

1 Motor plate
2 Side supports
3 Pretensioning device
4 Rubber suspension element with brackets
(MB 27: 2 brackets /
MB 38: 3 brackets)



MB 27 × 120
Steel parts blue painted



MB 38 × 300
Steel parts galvanized

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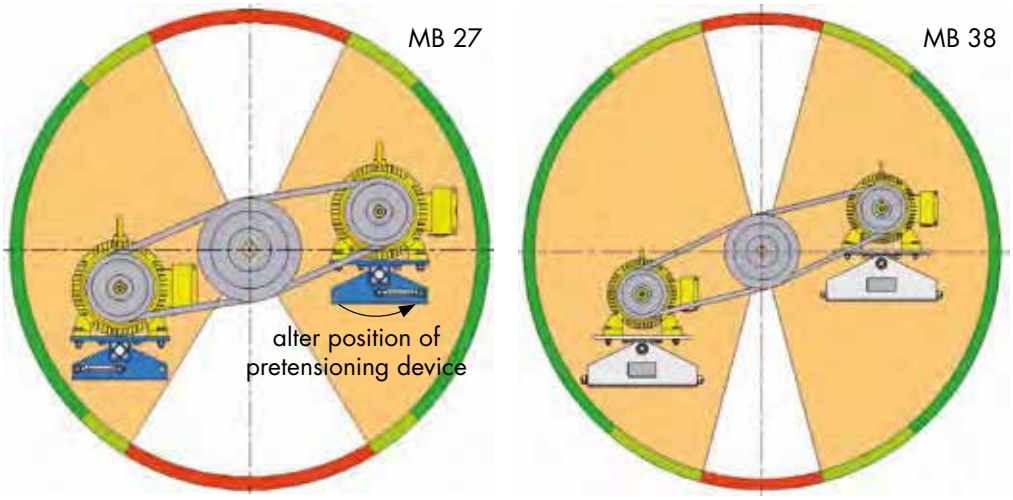
Mounting instructions for MB 27 and MB 38

1 Ascertainment of the ideal motorbase position



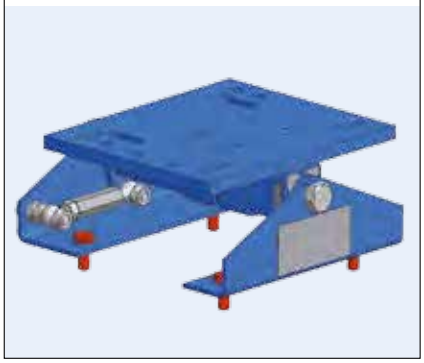
longest tensioning travel, ideal position of the MB

sufficient travel of the MB

in this position, insufficient travel is given (contact **ROSTA**)

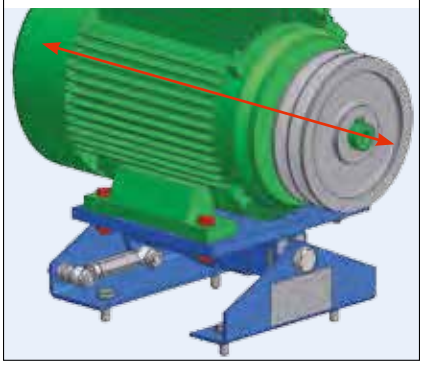
2 Support fixations

MB 27:
4 oblong holes 11 × 25 mm
MB 38:
4 oblong holes 13.5 × 35 mm



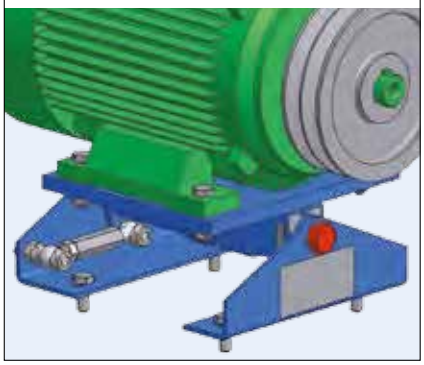
3 Alignment of pulleys and motor fixation

4 screws according relevant motor size



4 Loosen of the shaft screw (element axis)

MB 27: M16 and MB 38: M20

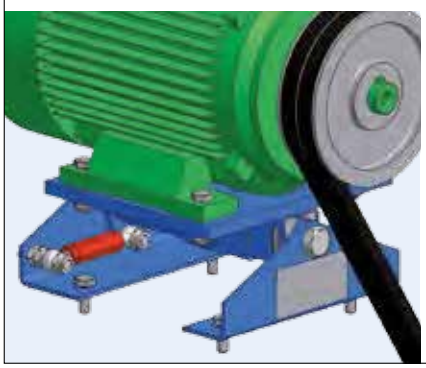


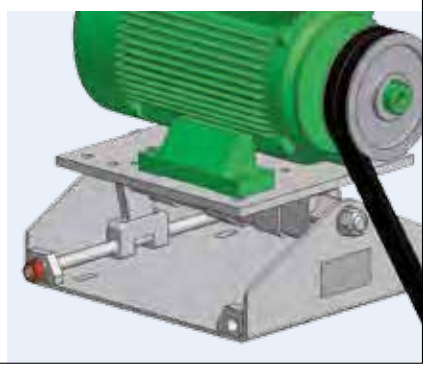
5 Insert and tension the belts, control belt test force

Tensioning of the belts according to belt suppliers recommended test force (table on page 5.5).

MB 27: by means of threaded bushing M10

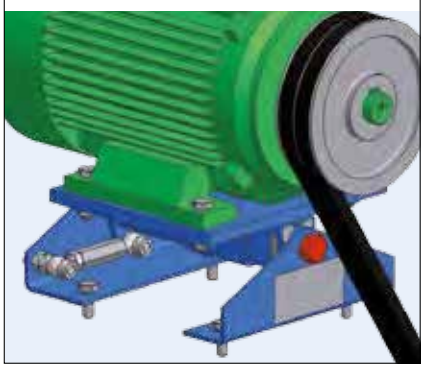
MB 38: by means of threaded shaft M16 × 1.5





6 Tighten of the shaft screw (element axis), start of operation

MB 27: M16 (locking torque 210 Nm)
MB 38: M20 (locking torque 410 Nm)



Retension:
Generally retensioning is not necessary, however, we recommend to inspect the belt tension after a few days of operation (after "running-in" of the belts).

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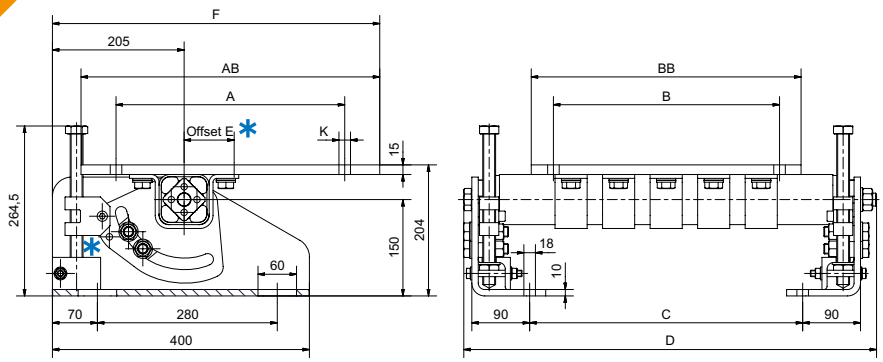
Motorbases
Type MB 50



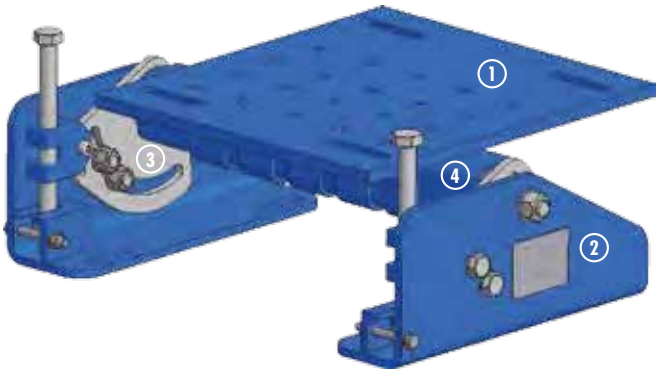
Art. No.	Type	IEC				NEMA				AB	BB	C	D	E	F	Weight [kg]
		Motor Frame Size	A	B	K	Motor Frame Size	A	B	K							
new 02 200 516	**MB 50×270-1**	160M 160L	254 254	210 254	14 14	254T 256T	254 254	210 254	14 14	320	315	245	463	25	437	41
02 200 507	**MB 50×270-2**	180M 180L	279 279	241 279	14 14	284T 286T	279 279	241 279	14 14	350	350	245	463	72	452	43
02 200 508	**MB 50×400**	200L	318	305	18	324T 326T	318 318	267 305	18 18	405	390	345	563	55	463	53
02 200 509	**MB 50×500**	225S 225M	356 356	286 311	18 18	364T 365T	356 356	286 311	18 18	465	420	425	643	72	510	60

Details regarding special designs, see pages 5.14–5.15.

* All ROSTA Motorbases MB 50 will be supplied with motor plate installed in **"off-set"** configuration. According to the final positioning of the base, the operating angle of the belts and the required tensioning travel, the motor plate can be altered in **"centered"** position on top of the element axis (recommendable by screen drive applications). Relevant threaded fixation holes are existent in plate.

For possibly required additional tensioning travel of the motor plate, the adjusting block of the pretensioning device can be set in the second hole-position of the friction plate (3).

1 Motor plate
2 Side supports
3 Pretensioning device
(MB 50×270-1 and MB 50×270-2: 1 device /
MB 50×400 and MB 50×500: 2 devices)
4 Rubber suspension element with axial-guide bearings and brackets (depending on size = 3–5 brackets)



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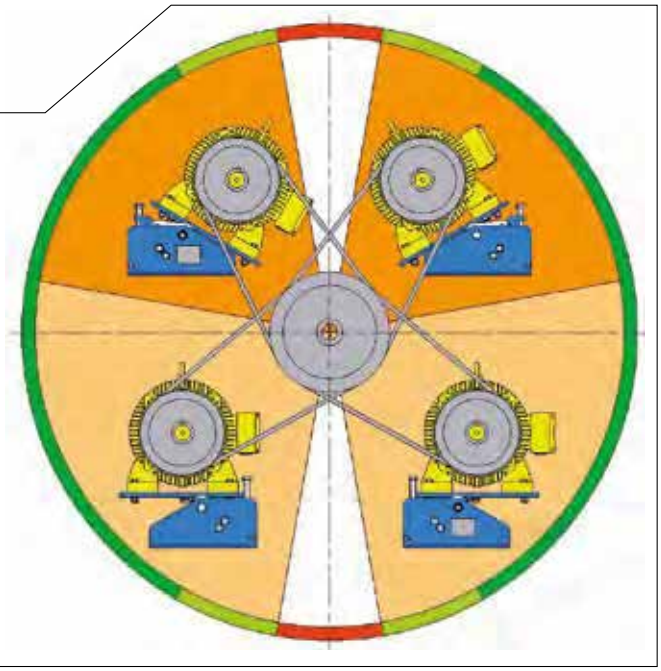
Mounting instructions for MB 50

1 Ascertainment of the ideal motorbase position

Operation area "above"
Motor plate standing ~ 30° inclined

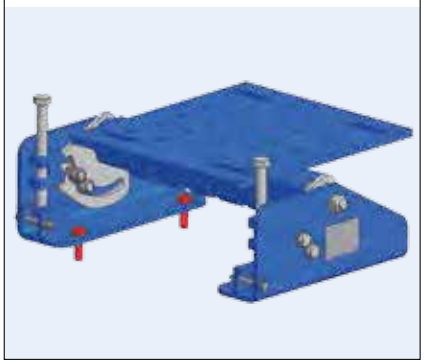
Operation area "below"
Motor plate standing ~ horizontal



longest tensioning travel, ideal position of the MB
sufficient travel of the MB
in this position, insufficient travel is given
(contact **ROSTA**)

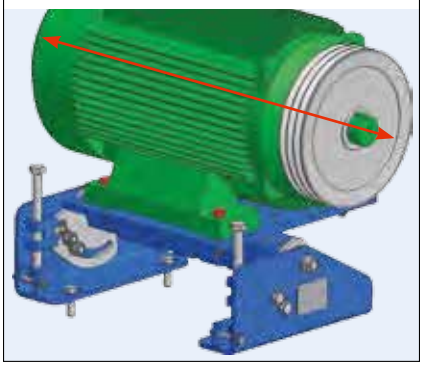
2 Support fixations

4 oblong holes 18×60 mm



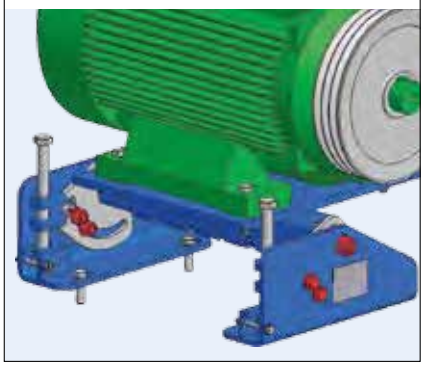
3 Alignment of pulleys and motor fixation

4 screws according relevant motor size



4 Loosen of the shaft screw (element axis) and of the screws on friction plate(s)

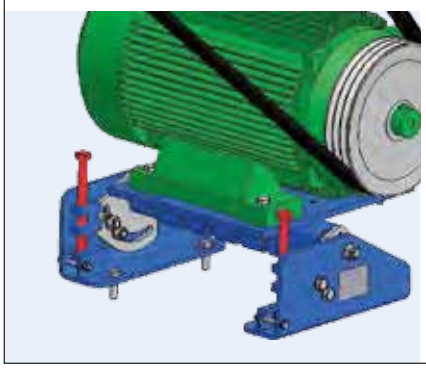
M20 and M16



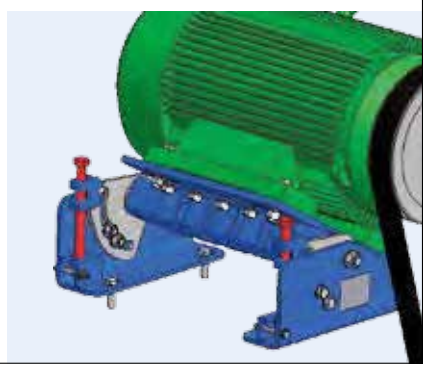
5 Insert and tension the belts, control belt test force

Tensioning of the belts according to belt suppliers recommended test force (table on page 5.5).

Operation area "below":
adjust with M20×1.5 screw
(for tightening = screw block upwards)

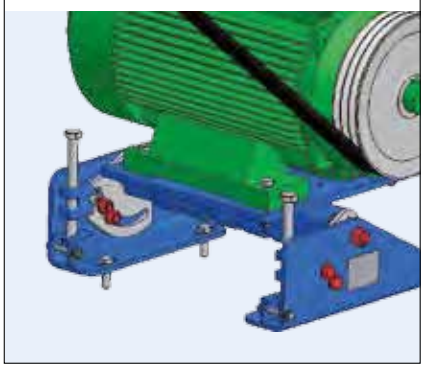


Operation area "above":
adjust with M20×1.5 screw
(for tightening = screw block downwards)



6 Tighten of the shaft and fixing screws on friction plate(s), start of operation

M20 (locking torque 410 Nm),
M16 (locking torque 210 Nm)



Retension:
Generally retensioning is not necessary, however, we recommend to inspect the belt tension after a few days of operation (after "running-in" of the belts).

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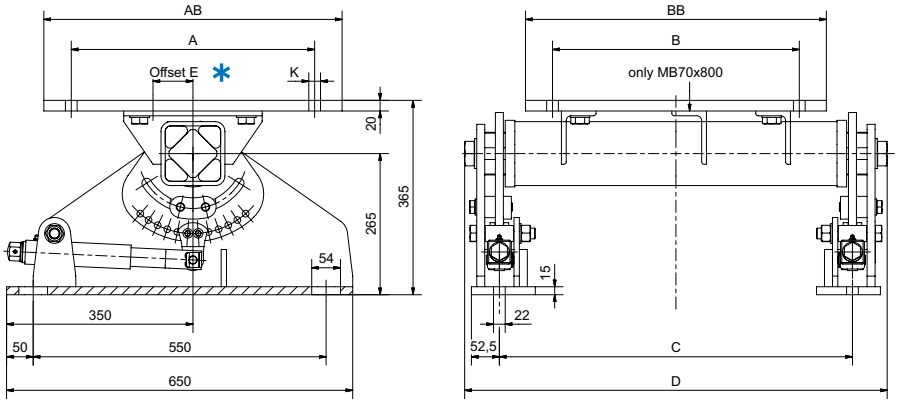
Motorbases
Type MB 70



Art. No.	Type	IEC				NEMA				AB	BB	C	D	E	Weight [kg]
		Motor Frame Size	A	B	K	Motor Frame Size	A	B	K						
02 200 710	**MB 70×400**	250M	406	349	22	404T	406	311	22	510	410	513	643	50	142
02 200 711	**MB 70×550**	280S	457	368	22	405T	406	349	22	560	565	663	793	50	169
		280M	457	419	22	444T	457	368	22						
02 200 712	**MB 70×650**	315S	508	406	26	445T	457	419	22	630	660	763	893	70	191
02 200 713	**MB 70×800**	315M	508	457	28	447T	457	508	22	630	805	913	1043	70	216
		315L	508	508	28	449T	457	635	22						

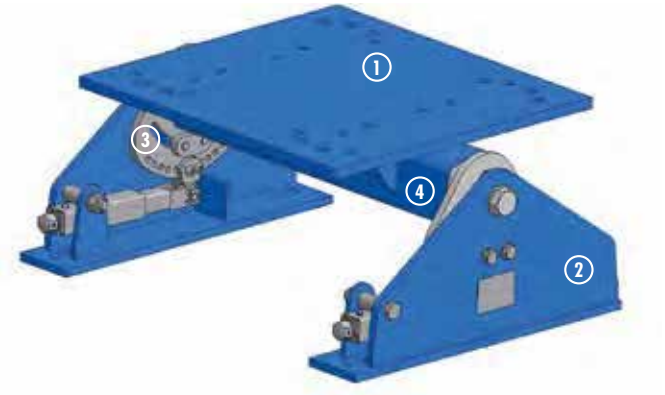
Details regarding special designs, see pages 5.14–5.15.

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

* All ROSTA Motorbases MB 70 will be supplied with motor plate installed in **"centered"** configuration on top of the element axis. According to the final positioning of the base, the operating angle of the belts and the required tensioning travel, the motor plate can be altered in **"off-set"** position. Relevant threaded fixation holes are existent in plate.

For possibly required additional tensioning travel of the motor plate, the fork head of the pretensioning device can be set in one of the eleven hole positions of the friction plate (3).

1 Motor plate
2 Side supports
3 Pretensioning devices = 2 devices
4 Rubber suspension element with axial guide bearings



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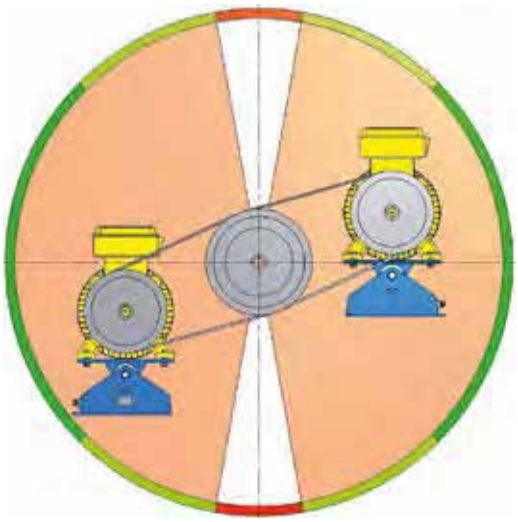
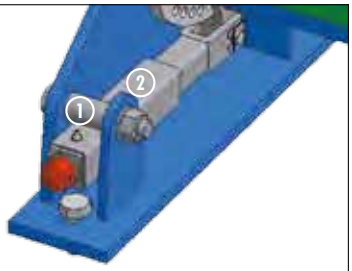
Mounting instructions for MB 70

1 Ascertainment of the ideal motorbase position

- longest tensioning travel, ideal position of the MB
- sufficient travel of the MB
- in this position, insufficient travel is given (contact **ROSTA**)





① 
Do not use compressed-air power tools for tensioning!

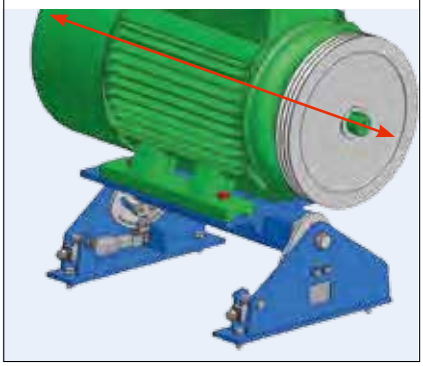
② 

2 Support fixations

4 oblong holes 22×54 mm

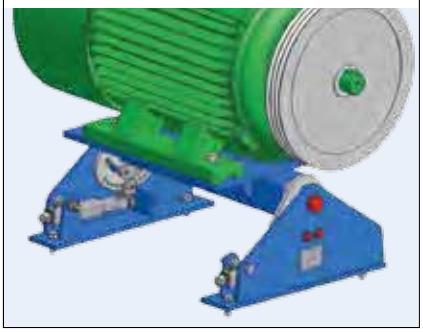
3 Alignment of pulleys and motor fixation

4 screws according relevant motor size



4 Loosen of the center screws (element axis) and of the screws on friction plates

M30 and M16



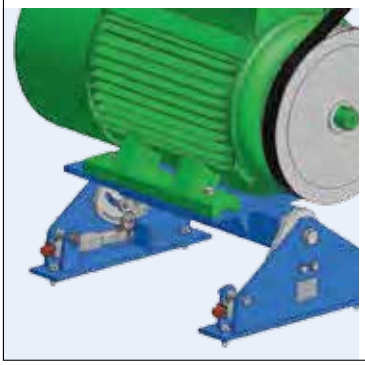
5 Insert and tension the belts, control belt test force

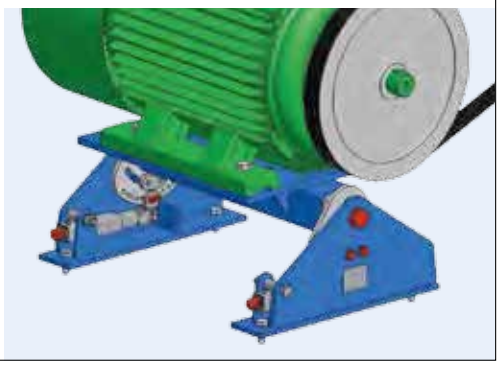
Tensioning of the belts according to belt suppliers recommended test force (table on page 5.5).

Adjust tension with screws M20

Readjustment of the pretensioning device to required tension travel

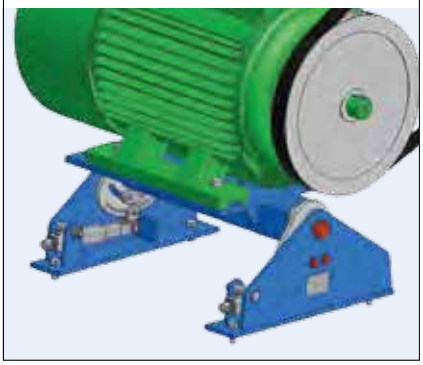
1. Tighten center screws and screws on friction plates
2. Loosen M12 hex-screws of fork head, select new position, assure new position of fork head again
3. Loosen the shaft and fixing screws again
4. Continue the tensioning with screws M20





6 Tighten of the center and fixing screws (friction plates), start of operation

M30 (locking torque 1400 Nm),
M16 (locking torque 210 Nm)



Retension:
Generally retensioning is not necessary, however, we recommend to inspect the belt tension after a few days of operation (after "running-in" of the belts).

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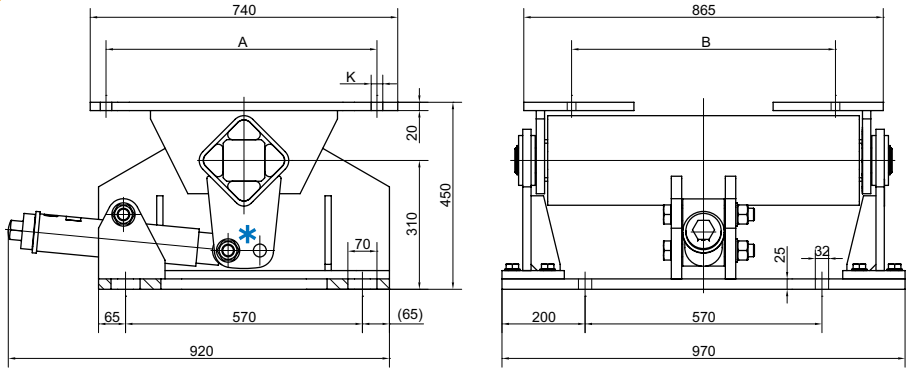
Motorbases
Type MB 100



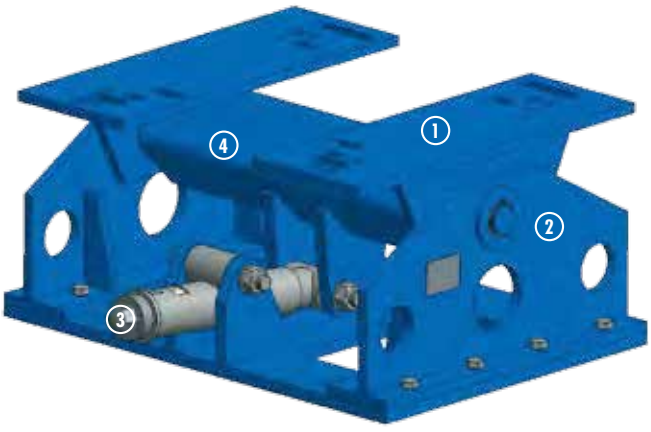
Art. No.	Type	IEC				NEMA				Weight [kg]
		Motor Frame Size	A	B	K	Motor Frame Size	A	B	K	
		315M	508	457	28	447T	457	508	21	490
		315L	508	508	28	449T	457	635	21	
new	02 200 900	355S	610	500	28	586/7	584	560	30	
	MB 100×750	355M	610	560	28					
		355L	610	630	28					

Details regarding special designs, see pages 5.14–5.15.

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

* For possibly required longer tensioning travel of the motor L-supports, the pretensioning device (3) shall be bolted into the front holes of the fork-head on the rubber suspension element.

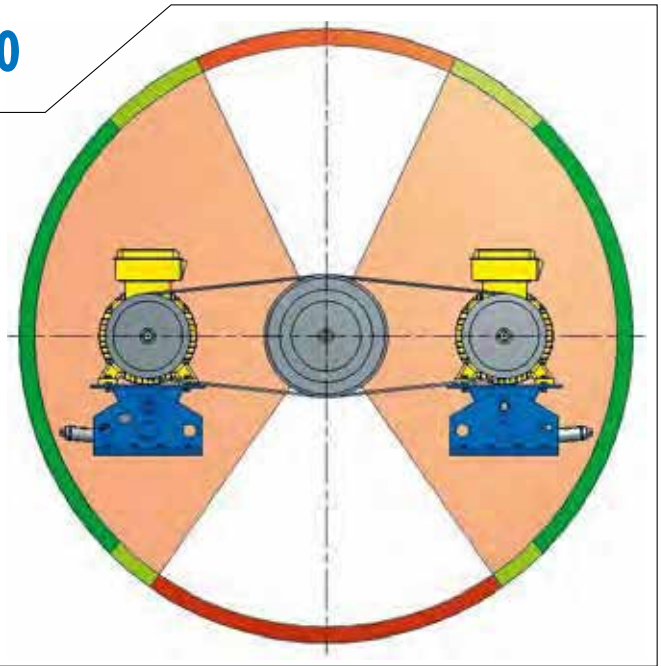
1 Motor L-supports
2 Side supports
3 Pretensioning device
4 Rubber suspension element



Mounting instructions for MB 100

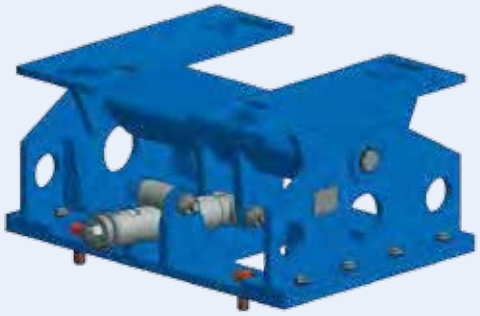
1 Ascertainment of the ideal motorbase position

longest tensioning travel, ideal position of the MB
sufficient travel of the MB
in this position, insufficient travel is given
(contact **ROSTA**)



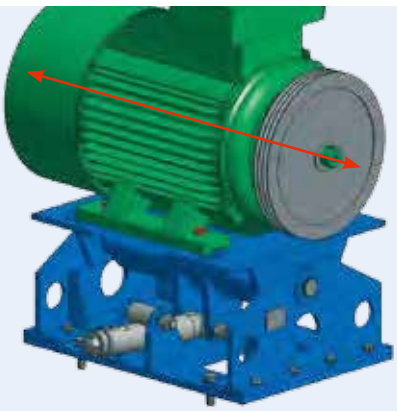
2 Support fixation

4 oblong holes 32×70 mm



3 Alignment of pulleys and motor fixation

4 screws according relevant motor size



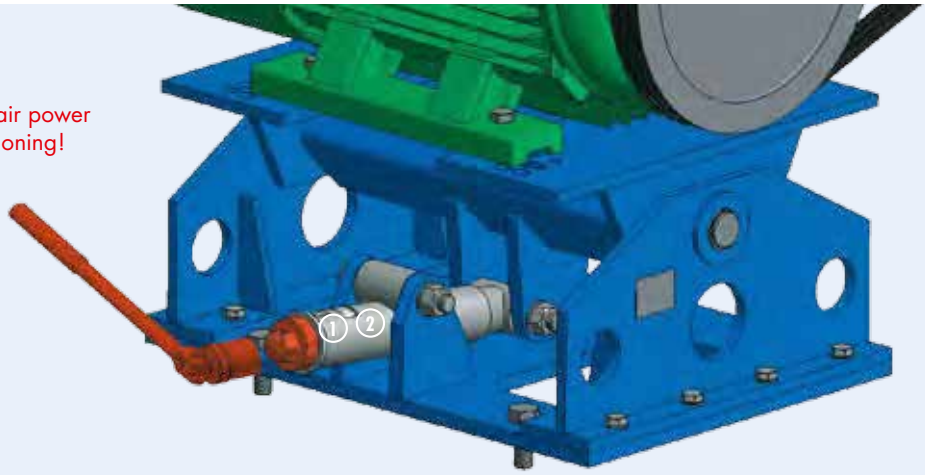
4 Insert and tension the belts, control belt test force

Tensioning of the belts according to belt suppliers recommended test force (table on page 5.5).
Adjust tension with 46 mm hook wrench

① 

Do not use compressed-air power tools for tensioning!

② 



Retension:
Generally retensioning is not necessary, however, we recommend to inspect the belt tension after a few days of operation (after "running-in" of the belts).

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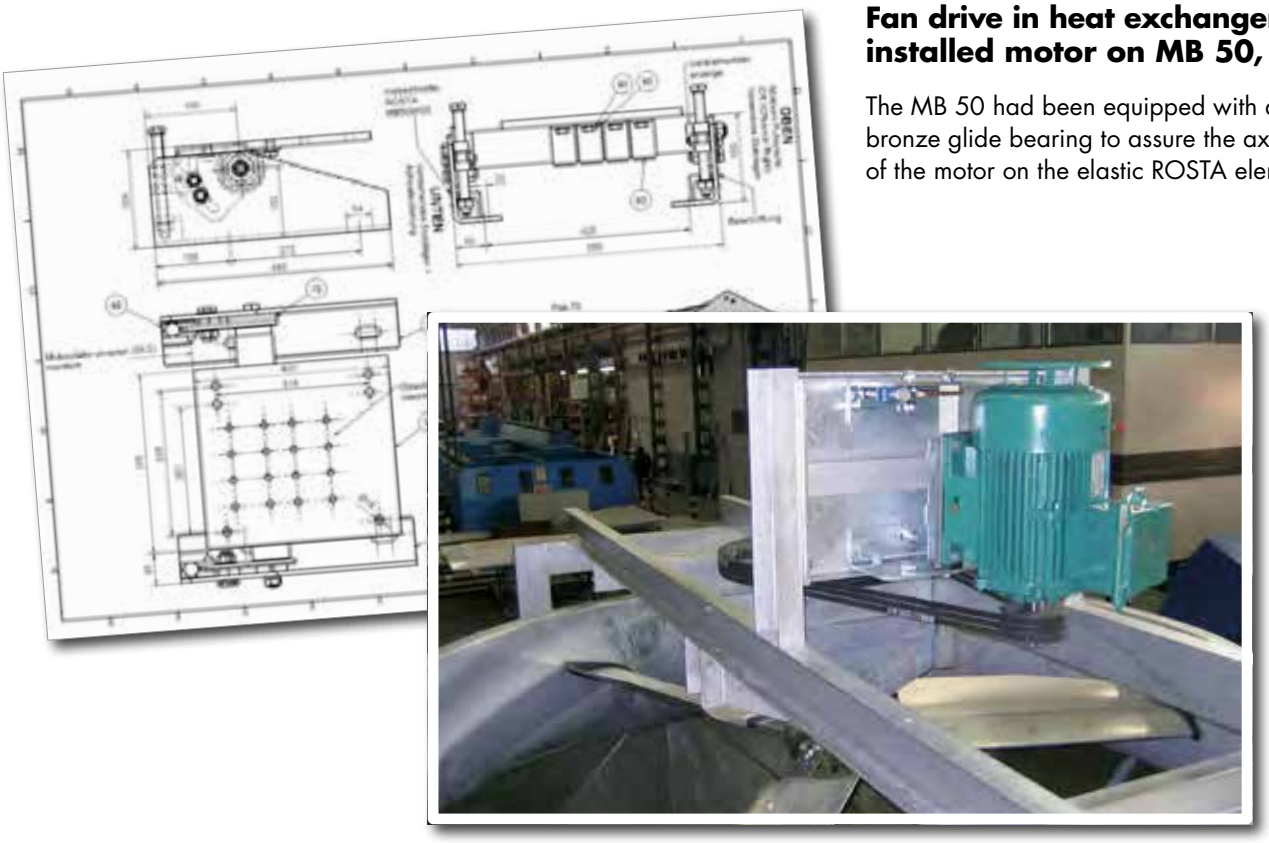
ROSTA Motorbases in customized design for special applications

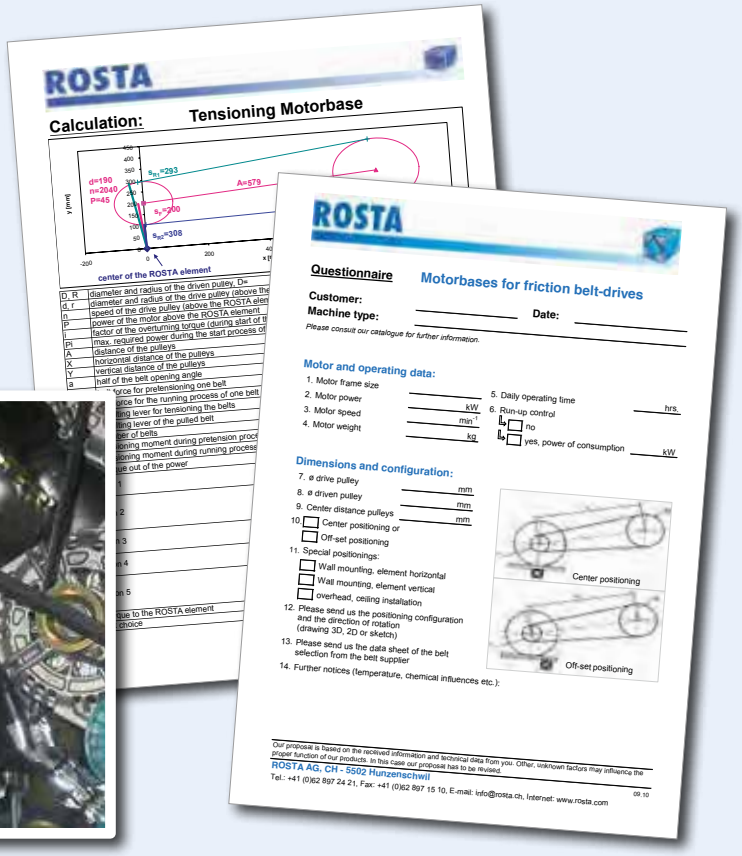


Fan drive in heat exchanger with vertically installed motor on MB 50, special

The MB 50 had been equipped with an additional bronze glide bearing to assure the axial position of the motor on the elastic ROSTA element.

Installation of cooling compressors in busses on MB 45 special, equipped with heat-resistant elastic inserts Rubmix 40

In this specific application, the ROSTA Motorbase is fulfilling two main functions: keeps the belt tightened between Diesel-engine and cooling compressor, does prevent the transmission of compressor vibrations into the bus chassis.



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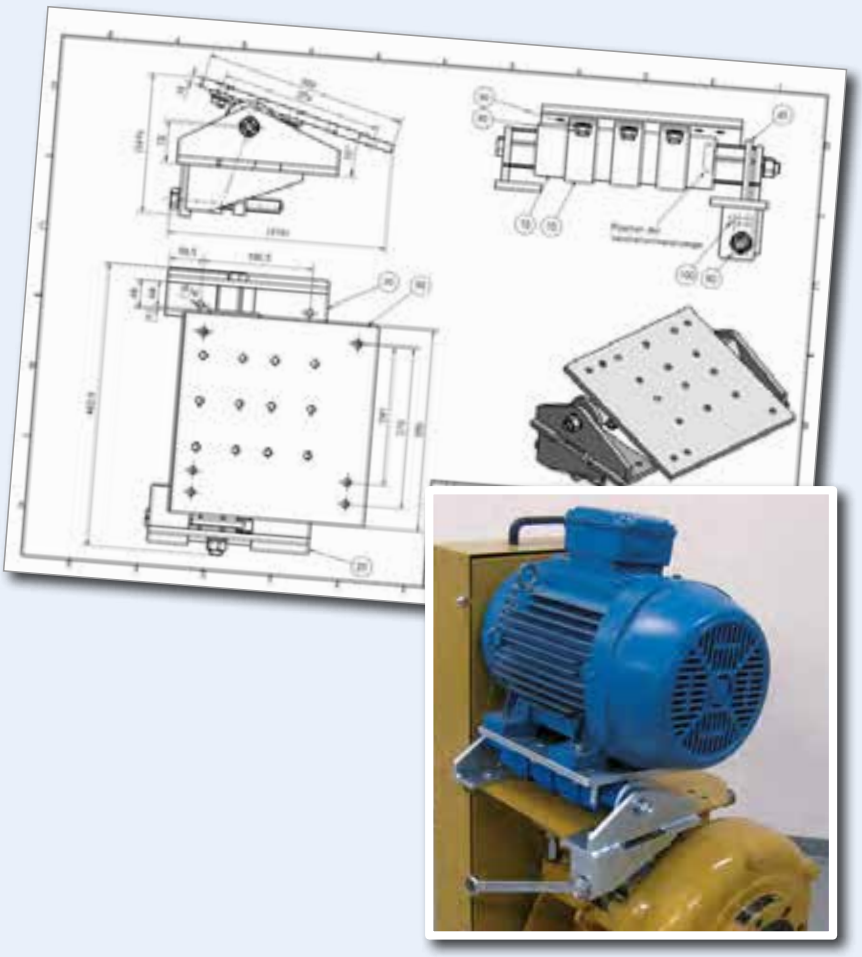

Drive motor of slurry-pump (centrifugal pump) installed on MB 50 × 270 special

The ROSTA Motorbase is assuring the continuous and slippage-free transmission of the required drive torque to maintain the high column of slurry material in mining fluid-transport systems.

Heavy-Duty belt and chain tensioners made out of Motorbase components

The ROSTA Motorbase elements are offering extremely high torques to tension heaviest chains and oversized belt drives.

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Unlimited possibilities!

A few examples:

ROSTA
swinging solutions

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Internet www.rosta.com

T2014.838

Administrative and Technical Information

1. Guidance, services and offers

Please contact your local ROSTA representative listed in our representatives list on the back of the catalogue if you have any questions or concerns.

We require a full list of technical specifications including any available sketches and data sheets for the preparation of an appropriate offer. This information makes it possible for us to determine whether a standard or custom element is the most cost-effective solution for you. For complex applications, our representative or the home office will send you a questionnaire about the exact specifications for what you need.

Terms and conditions for payments and deliveries are included with our offer or available on our website at www.rosta.com → Company → General Terms.

2. Orders and deliveries

Please include the offer number on your order along with the exact quantity, product name and number. Please send your order to your local ROSTA representative.

3. Availability

Most of the standard products listed in our catalogue are available from stock through your local representative or directly from ROSTA AG.

Custom pieces for a specific customer requirement are produced and delivered as specified in your order confirmation. The delivery time for special custom pieces can be reduced by signing a call order agreement (make-and-hold-order) with ROSTA AG. Please contact us if you would like to discuss this.

4. Technical information

Please observe the capacity limits for our elements as specified in the catalogue. If you are in doubt, please contact us or your ROSTA representative.

Please follow the assembly instructions detailed in the catalogue. Make sure that your assembly workers are instructed correctly. If you have any questions, please contact us or your ROSTA representative.

Assembling elements: To attach our elements or mounts, please always use the largest dimensioned standard machine bolts possible with a minimum strength class of 8.8 that fit into the drilled holes in the elements or attachment clamps. Use an ISO 898 table or your screw supplier's guidelines for the maximum tightening torque.

If in doubt, control your bolt attachments using the VDI Guidelines 2230.

Use DIN 125A stamped washers to attach housings with unworked drilled holes in the casting (for example AB 50) or oblong holes (for example MB supports).

5. Proviso

This catalogue and our other technical information are intended solely for your orientation and information; they may not be construed as absolutely binding in any way. We ask that you adapt the assembly and use of our products in a way suited to the prevailing conditions and situation.

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SF-00701 Helsinki
www.lektar.com

FRANCE

PRUD'HOMME Transmissions
FR-93203 Saint Denis
www.prudhomme-trans.com

GERMANY

ROSTA GmbH
DE-58332 Schwelm
www.rosta.de

GREAT BRITAIN

KOBO (UK) Ltd.
GB-Manchester M22 4RB
www.kobo.co.uk

GREECE

GEORG P. ALEXANDRIS S.A.
GR-185 45 Piraeus
www.alexandris.com

ICELAND

FALKINN Ltd.
IS-128 Reykjavik
www.falkinn.is

INDIA

Technotalent Pvt. Ltd.
IN-560058 Bangalore
www.technotalent.in

ITALY

ROSTA S.r.l.
IT-20020 Lainate-Milano
www.rostaitalia.com

JAPAN

MIKI PULLEY Co. Ltd.
JP-Zama-City, Kanagawa
www.mikipulley.co.jp

LITHUANIA / LATVIA

Techvitas
LT-94107 Klaipeda
www.techvitas.lt

MALAYSIA

Master Jaya Engineering
SDN BHD
MY-43300 Seri Kemban-
gan, Selangor
www.masterjaya.com.my

NETHERLANDS

Mijnsbergen BV
NL-3640 AD Mijdrecht
www.mijnsbergen.nl

NEW ZEALAND

SAECO Wilson
NZ-Auckland 1640
www.saecowilson.co.nz

NORWAY

JENS S. Transmisjoner A/S
NO-0612 Oslo
www.jens-s.no

PERU

Ducasse
PE-Miraflores Lima 18
www.ducasse.com.pe

Grupo I. S. C.
PE-Arequipa
www.grupo-isc.com

PHILIPPINES

Severo Syling Inc.
New Manila, Quezon City
Philippines 1112
www.severosyling.com

POLAND

ARCHIMEDES sp.z.o.o.
PL-87-100 Torun
www.archimedes.pl

PORTUGAL

APRIL Lda.
PT-1514-801 Lisboa
www.april.pt

RUSSIA

FAM
Machinery Components Parts
RU-199178 St. Petersburg
www.fam-drive.ru

SINGAPORE

SM Component
RS-128384 Singapore

SLOVENIA

M-Trade Gornja-Radgona
SI-9250 Gornja-Radgona
www.m-trade.si

SOUTH AFRICA

Orange Vibrator Motor
Co. Pty. Ltd.
ZA-0017 Doornpoort/Pretoria
www.orangevmc.co.za

SOUTH KOREA

SEWON Industrial Ltd.
KR-Seoul
www.sewonworld.co.kr

SPAIN

TRACSA S.L.
ES-08015 Barcelona
www.tracsa.com

SWEDEN

KONTIMA AB
SE-14901 Nynaeshamn
www.kontima.se

THAILAND

VIRTUS Company Ltd.
TH-10600 Bangkok
www.virtus.co.th

TURKEY

Entatek Industry Ltd.
TR-34776 Umraniye/Istanbul
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