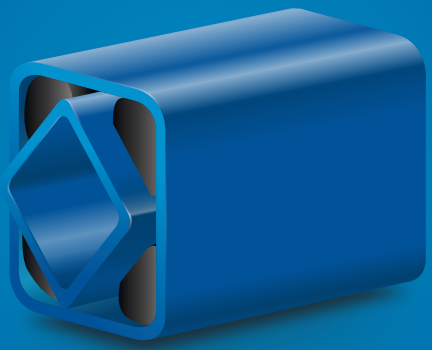
THE BLUE ONES FROM ROSTA

Components for increased output



Simple and clever

DEAR READER

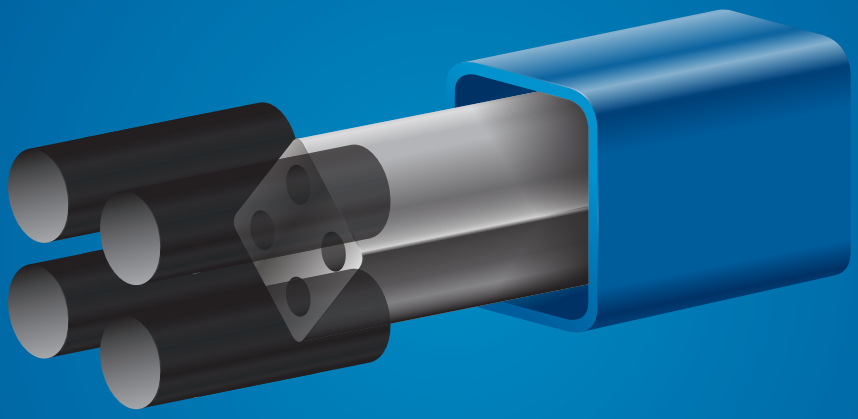
A unique success story for 75 years

Thanks to an innovative product idea, ROSTA is the world's leading manufacturer of rubber spring and damping systems. Since 1944, our consistent customer-centric approach has had top priority and contributes significantly to the sustained success of the company – enabling us to celebrate the 75th anniversary of our success story in 2019.

In addition to our headquarters and production site in Switzerland, ROSTA has 6 subsidiaries in Germany, Italy, Canada, the USA, China and Australia with over 120 employees. Our global network with over 30 partners in more than 40 countries positioning us to serve our customers far beyond our borders swiftly and promptly.

Many customers from all industries already benefit from our comprehensive know-how, becoming more profitable and competitive thanks to ROSTA products.

Our components are maintenance-free, noiseless, have a long service life and are used for a wide range of applications. Many years of experience in research and development in our own laboratory and the collaborative work with our partners and customers form an important knowledge base from which we can continue to offer innovative solutions.



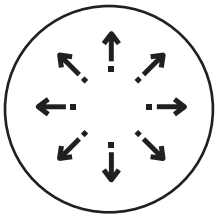
Perfect combination

TENSIONER DEVICES

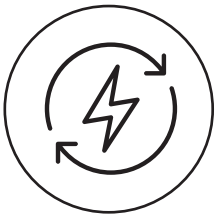
Optimum tension for chain and belt drives

– Quiet and smooth running
– Best possible transfer of power
– Automatic re-tensioning
– Compensation for belt elongation
– Pressing, guiding and vibration damping

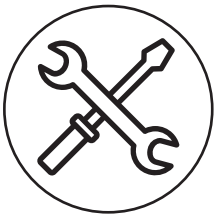
Product advantages:



wide range of applications



energy-saving



minimal maintenance costs

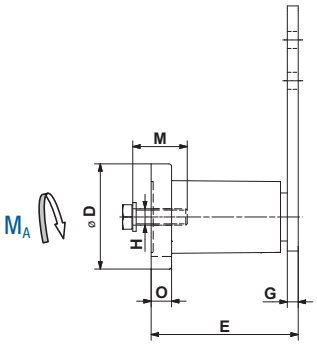
Selection table tensioner devices

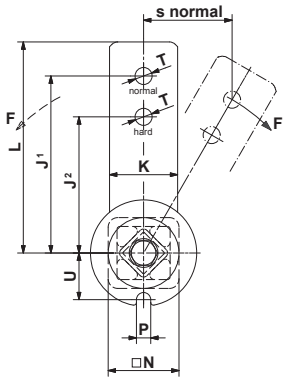
	Illustration	Type	Description	Page
Standard tensioner devices		**SE**	Standard component. Housing and inner part made out of steel. Rubber quality Rubmix 10. Steel parts ROSTA blue painted. Working temperature: – 40 ° to + 80 °C.	5.3
		**SE-G**	Oil resistant. Housing and inner part made out of steel. Rubber quality Rubmix 20. Steel parts galvanized. Marked with yellow dot. Working temperature: – 30 ° to + 90 °C.	
		**SE-W**	Heat resistant. Housing and inner part made out of steel. Rubber quality Rubmix 40. Steel parts ROSTA blue painted. Marked with red dot. Tension force 40% less than SE. Working temperature: – 35 ° to + 120 °C max.	
Additional tensioner devices		**SE-R**	Reinforced lever arm. Housing and inner part made out of steel. Rubber quality Rubmix 10. Arm and inner core especially welded for use on combustion engines and compressors. Steel parts ROSTA blue painted. Marked with white ring. Working temperature: – 40 ° to + 80 °C.	5.3
		**SE-I**	Housing and inner part made out of stainless steel. Rubber quality Rubmix 10. For the use in food- and pharmaceutic industries. Material: GX5CrNi19-10. Working temperature: – 40 ° to + 80 °C.	5.4
		**SE-B**	Boomerang®. Housing and inner part made out of steel. Rubber quality Rubmix 10. For the tensioning of very long chain and belt drives (triple compensation). Steel parts ROSTA blue painted. Working temperature: – 40 ° to + 80 °C.	5.5
		**SE-F**	Front mounting device. Housing and inner part made out of steel. Rubber quality Rubmix 10. As example for installations on blind-hole frames (fixation from the front only). Steel parts ROSTA blue painted. Hex socket screw quality 12.9. Working temperature: – 40 ° to + 80 °C.	5.6
		**SE-FE**	Front mounting. For installations on blind-hole frames (fixation from the front only). Steel parts painted black. Hex socket screw quality 12.9. Especially designed for engine applications. Working temperatur: see page 5.7.	5.7

Note about accessories on pages 5.8 – 5.15.

Tensioner Device

SE / SE-G / SE-W / SE-R



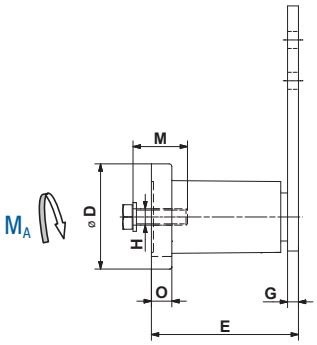


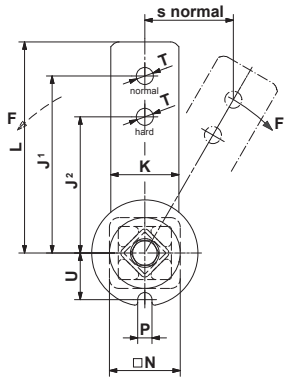
Part no.	Type	D	E	G	H	J^1	J^2	K	L	M	N	O	P	T	U	Weight [kg]
06 011 001	**SE 11**	35	$51^{+1}_{-0.5}$	5	M6	80	60	20	90	20	22	6	8	8.5	16.5	0.2
06 013 201	**SE 11-G**	35	$51^{+1}_{-0.5}$	5	M6	80	60	20	90	20	22	6	8	8.5	16.5	0.2
06 011 002	**SE 15**	45	$64^{+1}_{-0.5}$	5	M8	100	80	25	112.5	25	30	8	8.5	10.5	20.8	0.4
06 013 202	**SE 15-G**	45	$64^{+1}_{-0.5}$	5	M8	100	80	25	112.5	25	30	8	8.5	10.5	20.8	0.4
06 015 002	**SE 15-W**	45	$64^{+1}_{-0.5}$	5	M8	100	80	25	112.5	25	30	8	8.5	10.5	20.8	0.4
06 011 702	**SE-R 15**	45	$64^{+1}_{-0.5}$	5	M8	100	80	25	112.5	25	30	8	8.5	10.5	20.8	0.4
06 011 003	**SE 18**	58	$79^{+1}_{-0.5}$	7	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.7
06 013 203	**SE 18-G**	58	$79^{+1}_{-0.5}$	7	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.7
06 015 003	**SE 18-W**	58	$79^{+1}_{-0.5}$	7	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.7
06 011 703	**SE-R 18**	58	$79^{+1.5}_{-0.5}$	7	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.7
06 011 004	**SE 27**	78	$108^{+1.5}_{-0.5}$	8	M12	130	100	50	155	40	52	15	10.5	12.5	34.3	1.8
06 013 204	**SE 27-G**	78	$108^{+1.5}_{-0.5}$	8	M12	130	100	50	155	40	52	15	10.5	12.5	34.3	1.9
06 015 004	**SE 27-W**	78	$108^{+1.5}_{-0.5}$	8	M12	130	100	50	155	40	52	15	10.5	12.5	34.3	1.8
06 011 005	**SE 38**	95	$140^{+2}_{-0.5}$	10	M16	175	140	60	205	40	66	15	12.5	20.5	42.0	3.3
06 013 205	**SE 38-G**	95	$140^{+2}_{-0.5}$	10	M16	175	140	60	205	40	66	15	12.5	20.5	42.0	3.3
06 015 005	**SE 38-W**	95	$140^{+2}_{-0.5}$	10	M16	175	140	60	205	40	66	15	12.5	20.5	42.0	3.3
06 011 006	**SE 45**	115	200^{+2}_{-1}	12	M20	225	180	70	260	50	80	18	12.5	20.5	52.0	6.4
06 013 206	**SE 45-G**	115	200^{+2}_{-1}	12	M20	225	180	70	260	50	80	18	12.5	20.5	52.0	6.5
06 015 006	**SE 45-W**	115	200^{+2}_{-1}	12	M20	225	180	70	260	50	80	18	12.5	20.5	52.0	6.4
06 011 007	**SE 50**	130	210^{+3}_{-1}	20	M24	250	200	80	290	60	87	20	17	20.5	57.5	10.4
06 013 207	**SE 50-G**	130	210^{+3}_{-1}	20	M24	250	200	80	290	60	87	20	17	20.5	57.5	10.3
06 015 007	**SE 50-W**	130	210^{+3}_{-1}	20	M24	250	200	80	290	60	87	20	17	20.5	57.5	10.3

Further product and performance data in chapter 7 «Technology».
SE-R: Tensioning element with strengthened tensioning arm
If no other units are specified, the numbers given are in mm.

Tensioner Device

SE-I



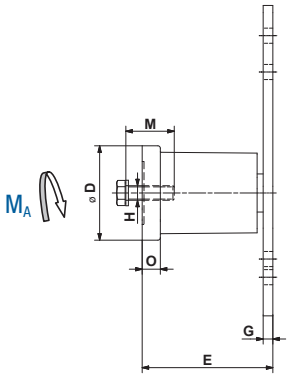


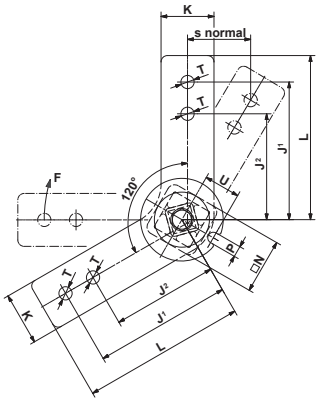
Part no.	Type	D	E	G	H	J[1]	J[2]	K	L	M	N	O	P	T	U	Weight [kg]
06 071 111	**SE-I 15**	45	$64^{+1}_{-0.5}$	5	M8	100	80	25	112.5	25	30	8	8.5	10.5	20.8	0.4
06 071 112	**SE-I 18**	58	$79^{+1.5}_{-0.5}$	7	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.8
06 071 113	**SE-I 27**	78	$108^{+2}_{-0.5}$	8	M12	130	100	50	155	40	52	15	10.5	12.5	34.3	2.3
06 071 114	**SE-I 38**	95	$140^{+2}_{-0.5}$	10	M16	175	140	60	205	40	66	15	12.5	20.5	42.0	4.1

Further product and performance data in chapter 7 «Technology».
Tensioning element made out of stainless steel, INOX
If no other units are specified, the numbers given are in mm.

Tensioner Device

SE-B Boomerang®



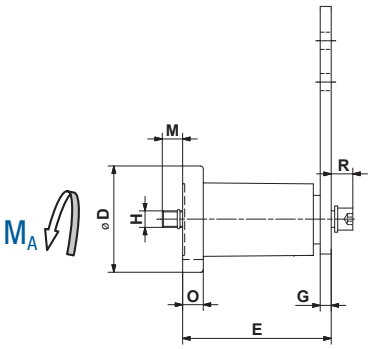


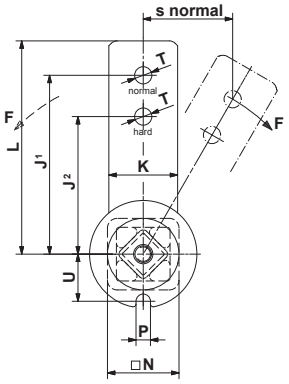
Part no.	Type	D	E	G	H	J^1	J^2	K	L	M	N	O	P	T	U	Weight [kg]
06 021 003	**SE-B 18**	58	$78^{+1.5}_{-0.5}$	6	M10	100	80	30	115	30	35	10.5	8.5	10.5	25.3	0.8
06 021 004	**SE-B 27**	78	$108^{+2}_{-0.5}$	8	M12	130	100	50	155	40	52	15	10.5	12.5	34.3	2.2

Further product and performance data in chapter 7 «Technology».
If no other units are specified, the numbers given are in mm.

Tensioner Device

SE-F



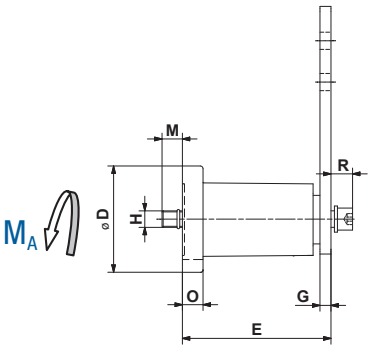


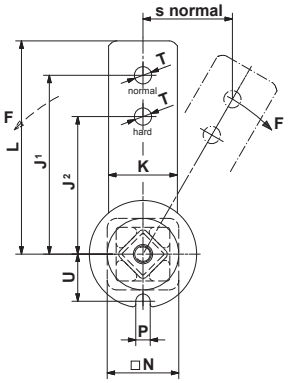
Part no.	Type	D	E	G	H	J^1	J^2	K	L	M	N	O	P	R	T	U	Weight [kg]
06 061 002	**SE-F 15**	45	$64^{+1}_{-0.5}$	5	M6	100	80	25	112.5	12	30	8	8.5	10	10.5	20.8	0.4
06 061 003	**SE-F 18**	58	$79^{+1.5}_{-0.5}$	7	M8	100	80	30	115	18	35	10.5	8.5	11	10.5	25.3	0.7
06 061 004	**SE-F 27**	78	$108^{+2}_{-0.5}$	8	M10	130	100	50	155	17	52	15	10.5	15	12.5	34.3	1.9
06 061 005	**SE-F 38**	95	$140^{+2}_{-0.5}$	10	M12	175	140	60	205	16	66	15	12.5	17	20.5	42.0	3.5
06 061 006	**SE-F 45**	115	200^{+3}_{-1}	12	M16	225	180	70	260	32	80	18	12.5	24	20.5	52.0	7.2
06 061 007	**SE-F 50**	130	210^{+3}_{-1}	20	M20	250	200	80	290	23	87	20	17	27	20.5	57.5	11.6

Further product and performance data in chapter 7 «Technology».
Tensioning element with front mounting.
Screw quality 12.9
If no other units are specified, the numbers given are in mm.

Tensioner Device

SE-FE





Part no.	Type	D	E	G	H	J[1]	J[2]	K	L	M	N	O	P	R	T	U	Weight [kg]
06 093 904	**SE-FE 27**	78	$110^{+2}_{-0.5}$	10	M10	130	100	50	155	16	52	15	10.5	15	12.5	34.3	2.1
06 095 905	**SE-FE 38**	95	$120^{+2}_{-0.5}$	10	M12	145	110	60	175	35	66	15	12.5	17	22.0	42.0	3.1

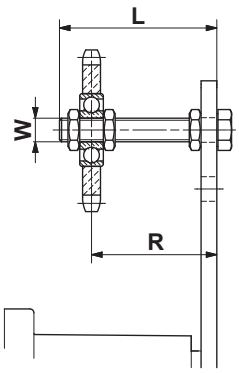
Part no.	Type	Rubber type	Working temperature	Marked with	Pre-tension ∢ 10° (J[1])		Pre-tension ∢ 20° (J[1])		Pre-tension ∢ 30° (J[1])		Coating
					F [N]	s [mm]	F [N]	s [mm]	F [N]	s [mm]	
06 093 904	**SE-FE 27**	Rubmix 20	−30° to + 90°C	yellow dot	150	23	380	44	810	65	RAL 9005 (black)
06 095 905	**SE-FE 38**	Rubmix 40	−35° to + 120°C	red dot	170	25	425	50	870	73	RAL 9005 (black)

Further product and performance data in chapter 7 «Technology».
Tensioning element with front mounting in special design.
Screw quality 12.9
If no other units are specified, the numbers given are in mm.

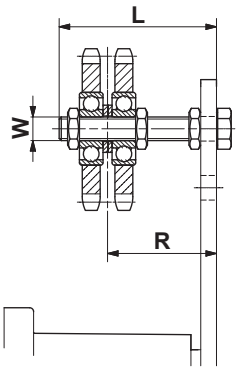
Tensioner Device

Sprocket wheel set N

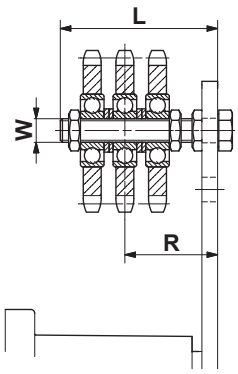
Simplex «S»



Duplex «D»



Triplex «T»



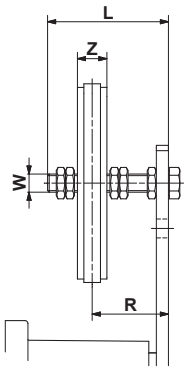
Part no.	Type	Roller chain ANSI	Roller chain DIN 8187	Number of teeth	W	L	Torque hex nut 0.5 d [Nm]	suitable for size SE	Adjusting range R with SE	Weight [kg]
Simplex «S»										
06 510 001	**N⅜"–10 S**	35	ISO 06 B-1	15	M10	55	20	15/18	22–43/23–43	0.15
06 510 002	**N½"–10 S**	40	ISO 08 B-1	15	M10	55	20	18	23–44	0.20
06 510 003	**N⅝"–12 S**	50	ISO 10 B-1	15	M12	80	35	27	27–65	0.35
06 510 004	**N¾"–12 S**	60	ISO 12 B-1	15	M12	80	35	27	27–65	0.55
06 510 005	**N¾"–20 S**	60	ISO 12 B-1	15	M20	100	165	38	40–80	0.85
06 510 006	**N1"–20 S**	80	ISO 16 B-1	13	M20	100	165	38	40–80	1.25
06 510 007	**N1¼"–20 S**	100	ISO 20 B-1	13	M20	100	165	45/50	40–80/48–80	2.00
06 510 008	**N1½"–20 S**	120	ISO 24 B-1	11	M20	140	165	45/50	40–120/48–120	2.35
Duplex «D»										
06 520 001	**N⅜"–10 D**	35	ISO 06 B-2	15	M10	55	20	15/18	27–39/28–39	2.00
06 520 002	**N½"–10 D**	40	ISO 08 B-2	15	M10	55	20	18	30–37	0.35
06 520 003	**N⅝"–12 D**	50	ISO 10 B-2	15	M12	80	35	27	36–57	0.60
06 520 004	**N¾"–12 D**	60	ISO 12 B-2	15	M12	80	35	27	37–56	1.05
06 520 005	**N¾"–20 D**	60	ISO 12 B-2	15	M20	120	165	38	50–90	1.35
06 520 006	**N1"–20 D**	80	ISO 16 B-2	13	M20	120	165	38	55–84	2.10
06 520 007	**N1¼"–20 D**	100	ISO 20 B-2	13	M20	140	165	45/50	60–102/68–102	3.60
06 520 008	**N1½"–20 D**	120	ISO 24 B-2	11	M20	140	165	45/50	65–97/73–97	4.25
Triplex «T»										
06 530 001	**N⅜"–10 T**	35	ISO 06 B-3	15	M10	70	20	18	33–48	0.25
06 530 002	**N½"–12 T**	40	ISO 08 B-3	15	M12	80	35	27	41–51	0.50
06 530 003	**N⅝"–12 T**	50	ISO 10 B-3	15	M12	80	35	27	43–50	0.95
06 530 004	**N⅝"–20 T**	50	ISO 10 B-3	15	M20	120	165	38	56–84	1.25
06 530 005	**N¾"–20 T**	60	ISO 12 B-3	15	M20	120	165	38	59–80	1.50
06 530 006	**N1"–20 T**	80	ISO 16 B-3	13	M20	160	165	45	74–108	2.90
06 530 007	**N1¼"–20 T**	100	ISO 20 B-3	13	M20	160	165	45/50	78–105/86–105	5.20
06 530 008	**N1½"–20 T**	120	ISO 24 B-3	11	M20	180	165	45/50	90–111/98–111	6.20

Allows accurate positioning of relevant chain track.
Ball-bearings 2Z/C3, permanently lubricated.
Working temperature: –40 ° bis +100 °C.
If no other units are specified, the numbers given are in mm.

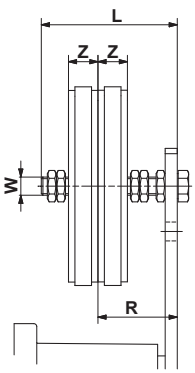
Tensioner Device

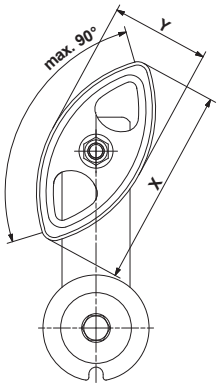
Chain rider set P

Simplex «S»



Duplex «D»



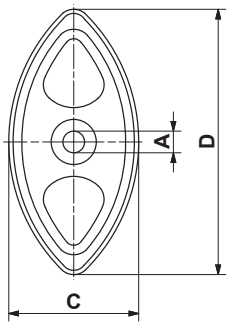


Part no.	Type	Roller chain ANSI	Roller chain DIN 8187	W	L	X	Y	Z	Torque hex nut 0.5 d [Nm]	suitable for size SE	Adjusting range R with SE	Weight [kg]
Simplex «S»												
06 550 001	**P⅜"–8 S**	35	ISO 06 B-1	M8	45	74	37	10.2	11	11	19–34	0.05
06 550 002	**P½"–10 S**	40	ISO 08 B-1	M10	55	96	48	13.9	20	15/18	23–41	0.10
06 550 003	**P⅝"–10 S**	50	ISO 10 B-1	M10	55	126	63	16.6	20	18	24–39	0.12
06 550 004	**P¾"–12 S**	60	ISO 12 B-1	M12	80	148	72	19.5	35	27	30–61	0.18
Duplex «D»												
06 560 001	**P⅜"–8 D**	35	ISO 06 B-2	M8	45	74	37	10.2	11	11	25–30	0.07
06 560 002	**P½"–10 D**	40	ISO 08 B-2	M10	55	96	48	13.9	20	15/18	30–34	0.12
06 560 003	**P⅝"–10 D**	50	ISO 10 B-2	M10	70	126	63	16.6	20	18	34–46	0.17
06 560 004	**P¾"–12 D**	60	ISO 12 B-2	M12	80	148	72	19.5	35	27	40–52	0.26

For double sided use. Max. allowed chain speed 1.5 m/sec.
Material: POM-H.
Working temperature: –40 ° bis +100 °C.
If no other units are specified, the numbers given are in mm.

Tensioner Device

Chain rider P

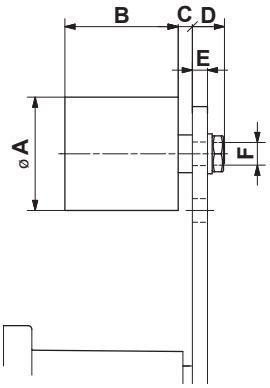


Part no.	Type	Roller chain ANSI	Roller chain DIN 8187	A	B	C	D	Weight [kg]
06 540 001	**P⅜"**	35	ISO 06 B	$8^{+0.2}_{0}$	10.2	37	74	0.02
06 540 002	**P½"**	40	ISO 08 B	$10^{+0.2}_{0}$	13.9	48	96	0.03
06 540 003	**P⅝"**	50	ISO 10 B	$10^{+0.2}_{0}$	16.6	63	126	0.05
06 540 004	**P¾"**	60	ISO 12 B	$12^{+0.2}_{0}$	19.5	72	148	0.07

For double sided use. Max. allowed chain speed 1.5 m/sec.
Material: POM-H.
Working temperature: –40 ° bis +100 °C.
If no other units are specified, the numbers given are in mm.

Tensioner Device

Tensioning roller standard R

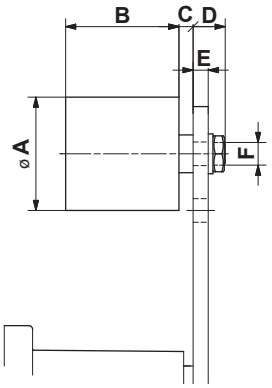


Part no.	Type	Max. speed [rpm]	Max. belt width	A	B	C	D	E	F	Torque hex nut 0.5 d [Nm]	suitable for size SE	Weight [kg]
06 580 001	**R 11**	8000	30	30	35	2	14	≤5	M8	25	11	0.08
06 580 002	**R 15/18**	8000	40	40	45	6	16	≤7	M10	20	15/18	0.17
06 580 003	**R 27**	6000	55	60	60	8	17	≤8	M12	35	27	0.40
06 580 004	**R 38**	5000	85	80	90	8	25	≤10	M20	165	38	1.15
06 580 005	**R 45**	4500	130	90	135	10	27	≤12	M20	165	45	1.75

Customer-specific øA or outer contours on request.
Material: PA 6. Ball-bearings 2Z/C3, permanently lubricated.
Working temperature: –35 ° bis +100 °C.
If no other units are specified, the numbers given are in mm.

Tensioner Device

Tensioning roller light RL

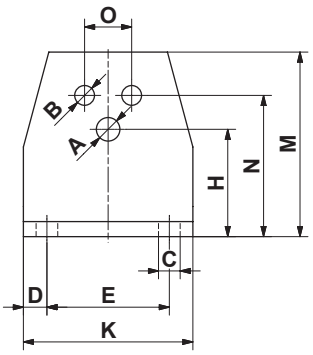


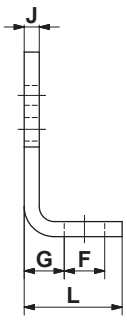
Part no.	Type	Max. speed [rpm]	Max. belt width	A	B	C	D	E	F	Torque hex nut 0.5 d [Nm]	suitable for size SE	Weight [kg]
06 580 901	**RL 11**	6 000	30	30	35	3	19	≤10	M8	25	11	0.08
06 580 902	**RL 15/18**	6 000	40	40	45	6	21	≤9	M10	49	15/18	0.17
06 580 903	**RL 27**	4 500	55	60	60	8	22	≤8	M12	86	27	0.50

Designed for light belt drive loads.
Material: PA 6. Ball-bearings 2Z / C3, permanently lubricated.
Working temperature: – 35 ° bis + 80 °C.
If no other units are specified, the numbers given are in mm.

Tensioner Device

Bracket WS



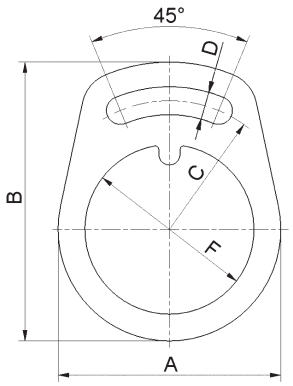


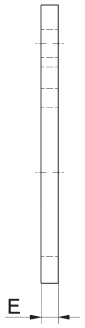
Part no.	Type	A	B	C	D	E	F	G	H	J	K	L	M	N	O	suitable for size SE	Weight [kg]
06 590 001	**WS 11**	6.5	5.5	7	7.5	30	13	11.5	27	4	45	30	46	35	10	11	0.08
06 590 002	**WS 15**	8.5	6.5	7	7.5	40	13	13.5	34	5	55	32	58	44	12	15	0.15
06 590 003	**WS 18**	10.5	8.5	9.5	10	50	15.5	16.5	43	6	70	38	74	55	20	18	0.28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

For the easy mounting of tensioners on the standard support (except SE 50).
If no other units are specified, the numbers given are in mm.

Tensioner Device

Safety Sockets



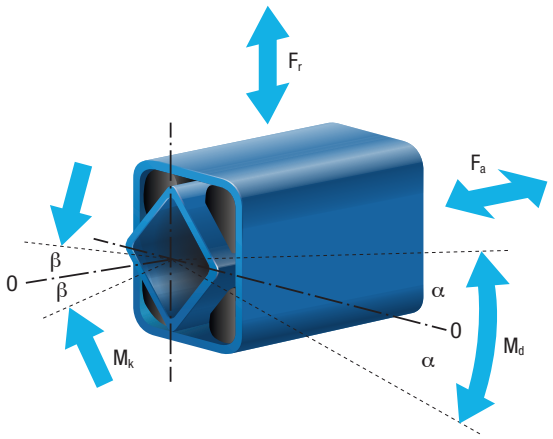


Part no.	**Type**	A	B	C	D	E	F	suitable for size SE	Weight [kg]
06 618 400	**SS 27**	104	130	60	13	8	79	27	0.35
06 618 394	**SS 38**	128	161	75	17	10	96.5	38	0.65

In case of uneven surfaces or coatings that give inadequate frictional locking, additional tensioning can be made with this safety clamp.
If no other units are specified, the numbers given are in mm.

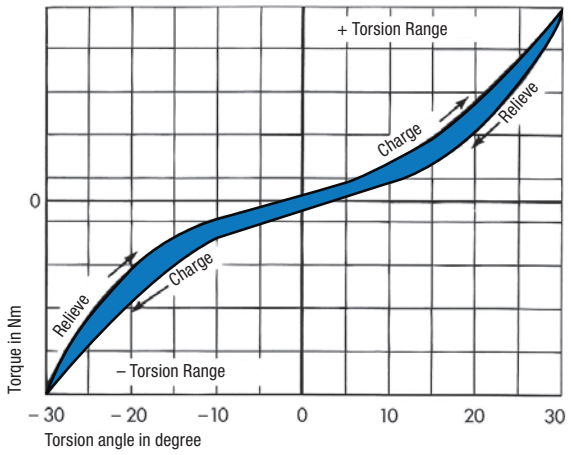
ROSTA Basics

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 elements and the additional load characteristics are indicated in the respective chapter.

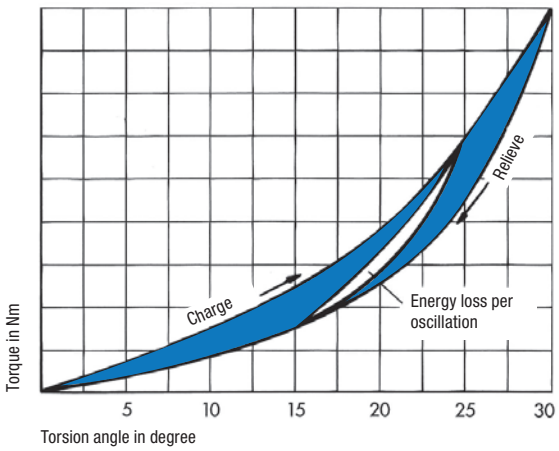
Spring characteristic

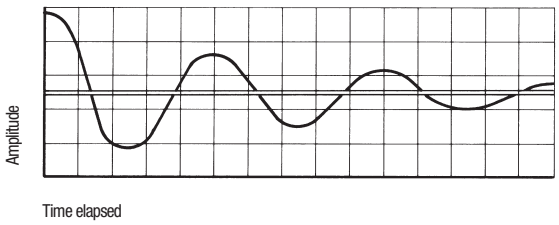


Due to the specific construction characteristics of the ROSTA rubber suspension element, pivoting the device ± results in a slightly progressive spring characteristic. The torsion angle is limited to ± 30 for most elements.

ROSTA Basics

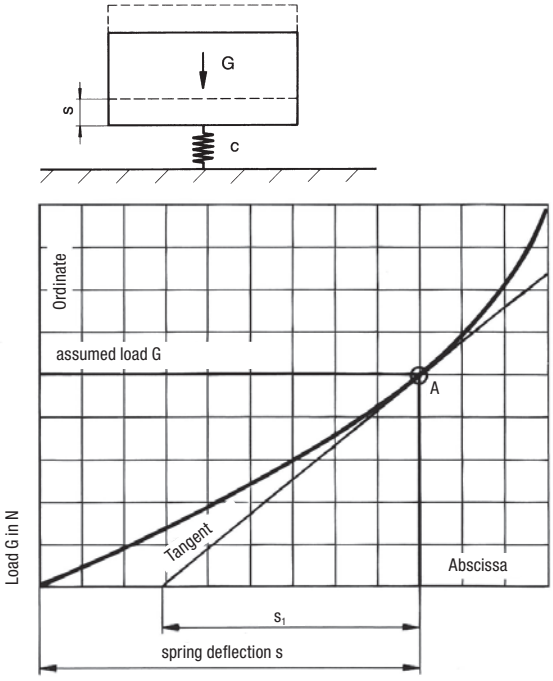
Damping





The occurring hysteresis 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).
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 neglectable; 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.)

Natural frequency



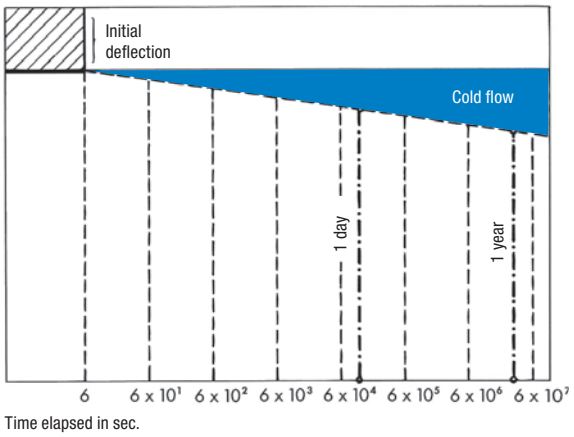
The determination of the natural frequency of a ROSTA suspension has to be carried out by spreading the tangent at the loading point «A» on the parabolic arc of the load deflection curve. The resulting distance s_1 on the axis of abscissa comes up to the arithmetical spring deflection in mm, required for the determination of the natural frequency.

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

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

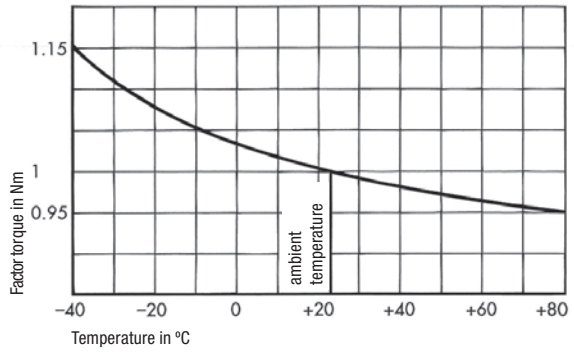
ROSTA Basics

Cold flow and settling of the rubber suspensions



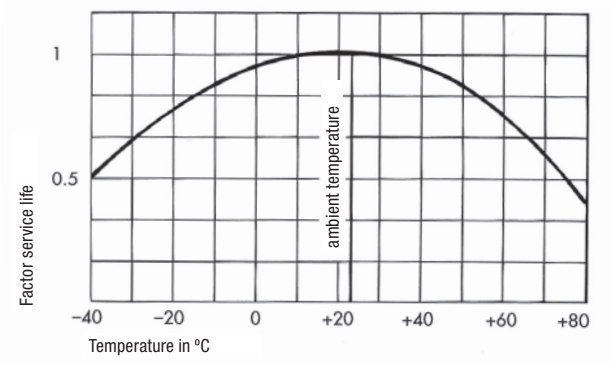
All elastic materials show more or less permanent measurable deformation over time when subjected to a load. This is noticeable in a relatively small additional deflection, the cold flow. This cold flow runs over a linear logarithmic time scale. The illustration shows that after being under a load for one day, already compensates for more than half of the flow deformation of a year; after one year of use, the overall element setting is largely compensated (depending on the temperature and frequency). Empirical findings show that the settling factor lies within a 3° to 5° loss of the element to the neutral 0° position, with combined vibrating bearings at approx. +10 % of the respective nominal deflection according to the catalogue specification.

Temperature influence



The ROSTA rubber suspension elements are designed in the standard rubber quality «Rubmix 10» for use in the temperature range of –40 °C to +80 °C. As the temperature rises, the mechanical torque strength decreases. This decrease is at a low approx. 5% in the upper temperature range (+80 °C). At lower ambient temperatures, i.e. in the minus range, the mechanical torsional stiffness increases (at –40 °C up to 15 %). The internal damping of the elements undergoes a similar process: when the temperature drops, the damping percentage increases and then falls again when the temperature rises. Due to the internal friction (energy loss work), the rubber inserts in the suspension elements warm up with every movement, meaning the effective element temperature may vary in relation to the ambient temperature.

Service life



Provided the rubber suspension elements are selected according to the 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.

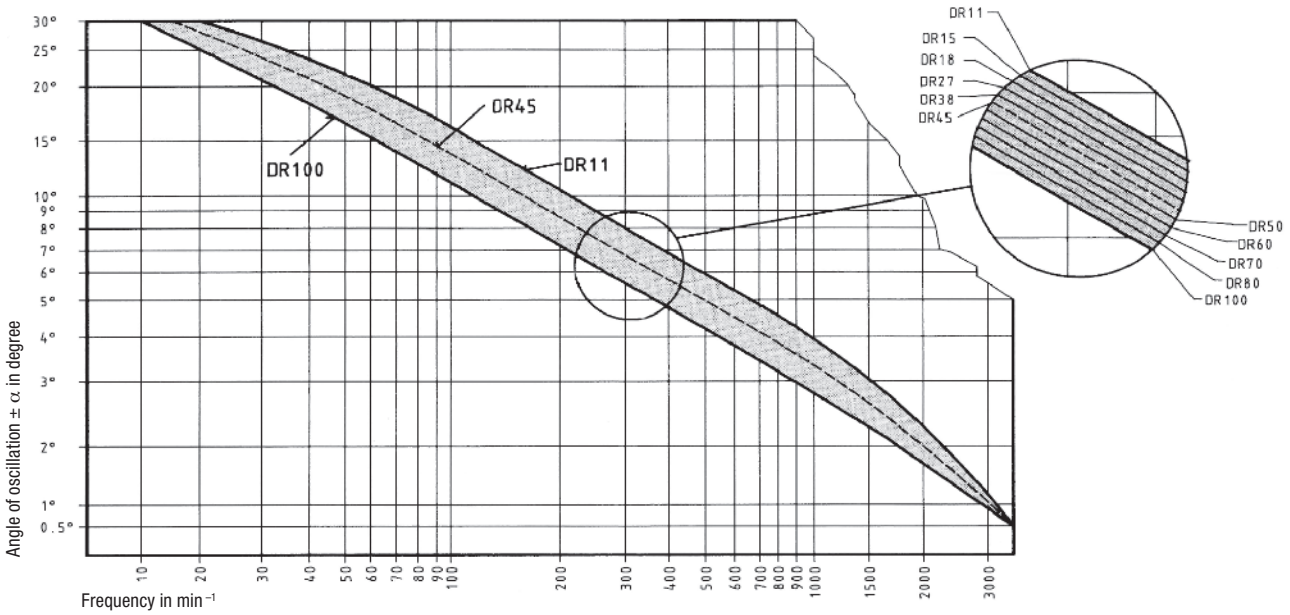
ROSTA Basics

Quality control and tolerances

Since December 1992 ROSTA AG has been an ISO 9001 standard certified development, manufacture and distribution company. All products undergo regular functional and quality testing. The rubber inserts are continuously tested and controlled on the test machines of the in-house laboratory 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 inner-core profiles and housings of the rubber suspension elements are subject to the tolerance guidelines of the relevant production process and respective supplier (e. g. cast, extruded, edge rolled) and the individual material consistence (e. g. aluminium casting, steel tube, nodular cast iron part, etc.). The resulting torsional moments and spring deflections of the ROSTA rubber suspension elements are within a tolerance range of ± 15 % at the most, but usually lie in a much narrower range!

ISO 9001
ISO 14001
BUREAU VERITAS
Certification

Permissible frequencies



Alignment chart for determining the permissible frequencies and oscillation angles in relation to the respective rubber suspension element type (DR 11, 15, 18, etc.).
The higher the frequency in min^{-1}, the lower the oscillation angle should 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.

ROSTA Basics

Rubber qualities

The majority of all ROSTA rubber suspension elements are equipped with the standard quality «Rubmix 10» rubber inserts. This rubber quality is based on a high content of natural rubber, offers good shape memory, low settling factors (cold flow), high mechanical strength and moderate aging behaviour (little embrittlement / hardening of the rubber inserts).

Where high oil consistency, heat resistance or even greater torques are required, other resilient inserts with the corresponding characteristics can be installed in the rubber suspension elements.

Special qualities on request.

Rubber quality	Factor in relation to the list «torque and loads» (chapter 2 rubber suspension elements)	Working temperature	Material	Comments
Rubmix 10	1.0	–40° to +80°C	NR	– Standard quality – Highest elasticity – Lowest cold flow
Rubmix 20	approx. 1.0	–30° to +90°C	CR	– Good oil-resistance – Elements marked with yellow dot
Rubmix 40	approx. 0.6	–35° 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

Chemical resistance

The standardised ROSTA rubber suspension elements are equipped with «Rubmix 10» elastic inserts. These have a high chemical resistance compared to many media. For specific applications, however, the elements must provided with additional protection or synthetically constructed elastomer inserts should be used («Rubmix 20», «Rubmix 40» or «Rubmix 50»), which will slightly the characteristics compared to the standard quality (see Rubber qualities).

The resistance table below is only a guideline and is incomplete. In practical use, data for the concentration of the respective medium and the operating temperature are required to determine the resistance. Please contact us in this regard.

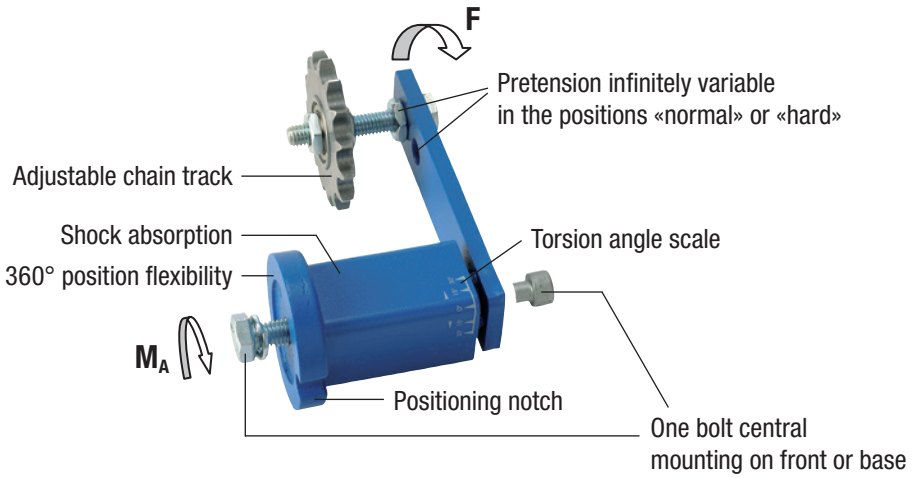
Rubmix	10	20	40	50
Acetone	+	oo	++	oo
Alcohol	++	++	++	o
Benzene	oo	oo	oo	oo
Caustic soda solution up to 25% (20°)	++	++	++	oo
Citric acid	++	+	o	oo
Diesel	oo	+	oo	+
Formic acid	+	+	o	oo
Glycerine	+	+	++	oo
Hydraulic fluid	o	+	oo	oo
Hydrochloric acid up to 15%	++	+	o	oo
Javelle water	o	+	++	oo
Lactic acid	++	++	++	+

Rubmix	10	20	40	50
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

++ excellent consistency, + good consistency, o sufficient consistency, oo insufficient consistency

Tensioner devices

Tensioner device



Tensioning force F

Tensioning forces for lever position «normal» for SE / SE-G / SE-R / SE-R / SE-I

Size SE	Pre-tension ∢ 10°		Pre-tension ∢ 20°		Pre-tension ∢ 30°	
	F [N]	s [mm]	F [N]	s [mm]	F [N]	s [mm]
11	18	14	48	27	96	40
15	25	17	65	34	135	50
18	75	17	185	34	350	50
27	150	23	380	44	810	65
38	280	30	720	60	1500	88
45	520	39	1350	77	2650	113
50	740	43	2150	86	4200	125

The tensioning force can be continuously adjusted. The max. pre-tensioning angle is 30° out of neutral position.

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

SE-W: 40 % lower tensioning force than standard versions (Rubmix 40).
SE-FE: see SE-FE in chapter 5.

Tightening torque M_A

	Quality 8.8	Quality 12.9 for SE-F / SE-FE
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	

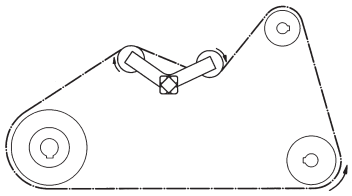
Table mentioning the tightening torque for the central screw (included in scope of delivery).

Tensioner devices

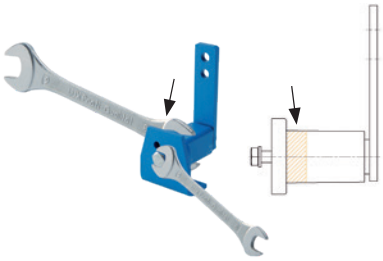
Installation guidelines

«Z» layout
If chain tensioning wheels / chain sliders or tension rollers are mounted on the outer lever side, the distance «Z» should be as low as possible. The maximum pre-tensioning force F should not exceed 50 % (~ 20° pre-tensioning).

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.



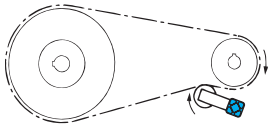
Assembly
The central screw is tightened slightly. The tensioner housing is set with a wrench and tightened in the desired direction. Then tighten the screw with the appropriate M_A tightening torque. Position the wrench near the flange bottom.



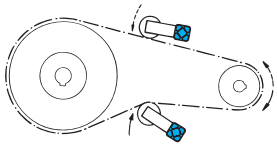
Chain or belt drives
Further assembly instructions specific for chain or belt drives on the following pages.

Installation guidelines for chain drives

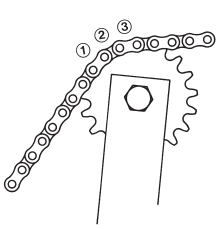
Standard positioning
The ROSTA tensioning device should be placed on the slack-side of the chain drive, close by the smaller sprocket wheel in order to enlarge its contact-arc, therefore contact application from outer side of drive. In mounted position the tensioner-arm should stay close to parallel 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.



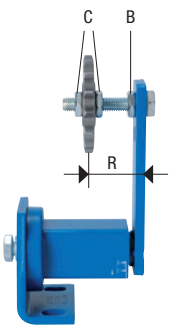
Reversible chain drive
On reversing chain drives, we recommend installing two chain tensioners, one per chain strand. Due to the constantly alternating slackening, depending on the direction of travel of the drive, both tensioners should only be pre-tensioned to a maximum of 20° to retain a free return angle of 10° when changing from the «slack section» to the «working section».



Sprocket teeth engaged
When tightening for the first time, at least 3 teeth of the sprocket must be engaged with the chain. The free length of the chain between tensioning wheel and the next sprocket should be at least 4 sections.



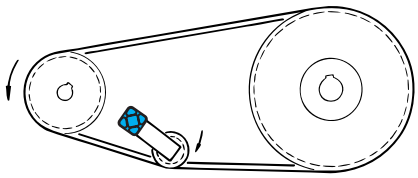
Chain track
The tensioner sprocket and the chain sliders should be positioned on the track between 2 nuts «C». The chain track can be precisely set by adjusting the setting range R. The lock nut «B» is always tight.



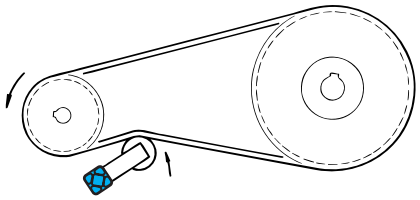
Tensioner devices

Installation guidelines for belt drives

1. Layout in belt drives



Tensioning from inside the belt drive with a V-belt pulley
– When installing in the slack section, both belt pulleys must have sufficient wrap angles (driver and driven).
– For vibration-intensive drives with very long centre distances, it is recommended use deep-grooved pulleys.



Tensioning with flat roller on the back of the belt
– Roll diameter should be at least ⅔ of the diameter of the smallest pulley.
– Roll width approx. 20 % bigger than the overall width of the belt unit.
– When installing in the slack section, both belt pulleys must have sufficient wrap angles (driver and driven).

2. Selection of the ROSTA tensioner device

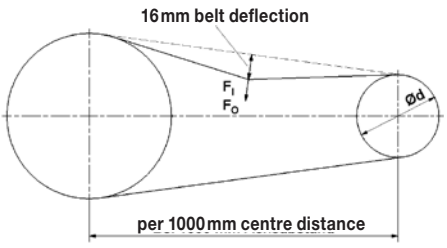
Reference value table for the most commonly used V-belt types

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, SE-B and SE-FE) 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 tensioning force F)
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.

** 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.

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



PRODUCTIVITY THROUGH COMPETENCE

Head office
Switzerland www.rosta.ch

Subsidiaries
Germany www.rosta.de **Italy** www.rostaitalia.com
Canada www.rosta.ca **USA** www.rosta.us
Australia www.rostaaustralia.com.au **China** www.rostachina.com

Distribution partners
For informations about our distribution partners worldwide please go to **www.rosta.ch/en/contacts/distribution-partners**

ROSTA AG
Hauptstrasse 58
5502 Hunzenschwil
Switzerland
+41 62 889 04 00
info.ch@rosta.com
www.rosta.com