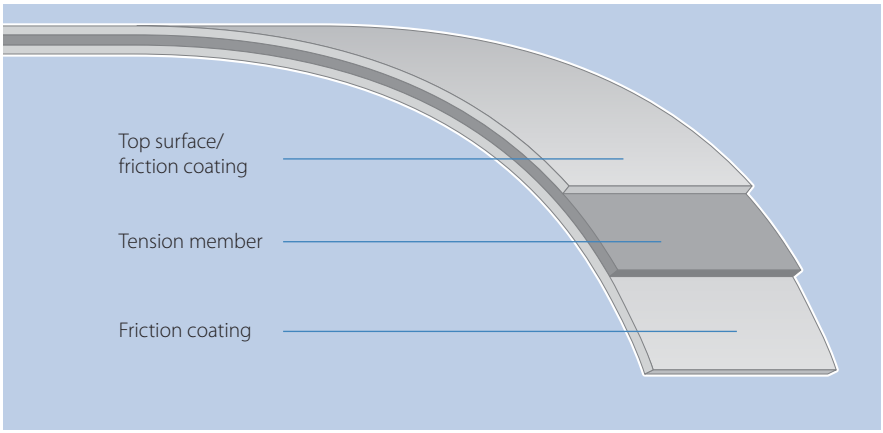
siegling extremultus
flat belts

Technical Information



In this publication you will find important basic information about your Siegling Extremultus product. This information applies in general to the use of Siegling Extremultus as power transmission belt, tangential belt, spindle tape, folder and carrier belt, belt for live roller conveyors and layboy tapes.

Siegling Extremultus high-efficiency flat belts can withstand heavy stress, have a high degree of efficiency, excellent damping properties and long belt lives, and are exceptionally robust.

This makes them the ideal power transmission element for dry and also dusty operating conditions in all sectors of industry.

They have a low power requirement, treat machinery gently and reduce costs.

Constructions

Siegling Extremultus is manufactured as 5 lines with differing tension member designs.

P line
– with a tension member of highly-orientated polyamide sheet or a tension member of polyamide fabric

E line
– with a highly-modular thermoplastic tension member design with polyester fabric

A line
– with a highly-modular thermoplastic tension member design with aramide fabric

Elastic line
– with elastic tension member

Endless line
– with a tension member of helically-wound endless polyester cord

Contents

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Types

Within each line various types are distinguished according to their coating materials.

Materials

G	=	G elastomer
L	=	chrome leather
N	=	Novo (polyester web)
T	=	polyamide fabric
U	=	urethane
P	=	polyamide

Examples of sub-types

GT	=	G elastomer friction coating/ fabric top surface
GG	=	G elastomer friction coating on both faces
LT	=	chrome leather friction covering/fabric top surface
LL	=	chrome leather friction covering on both faces
TU	=	urethane friction coating/ fabric top surface
UU	=	urethane friction coating on both faces

Properties

Siegling Extremultus is antistatic, meeting standard international and many national regulations pertaining to the prevention of electrostatic build-up in explosion-proof areas.

Siegling Extremultus sub-types GT, GG, TG, TU, TT, UU, UN, NN, UG, PU, PP are impervious to oils and greases as well as most commercially available solvents. To ensure however that Siegling Extremultus functions perfectly, it must be kept free of oil and grease.

Siegling Extremultus sub-types LL, LT, TT are impervious to machine oil, diesel fuel, petrol, benzene, commercially available solvents such as ethyl acetate, acetone, etc., chlorinated hydrocarbons such as perchloro-ethylene, etc.

Sub-types with leather coverings on one or both sides can be used where oil and grease are a factor.

Siegling Extremultus is not impervious to organic or inorganic acids.

Detailed information about the chemical resistance is available on request.

Permissible operating temperatures:

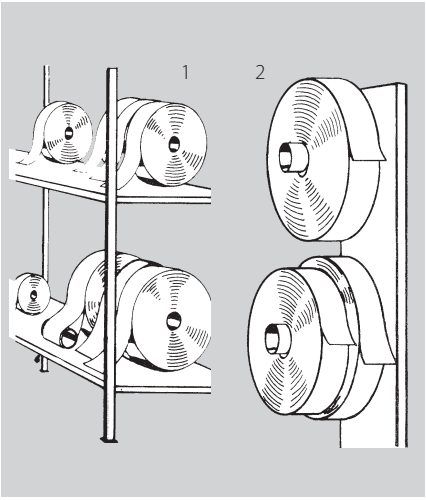
P line	(all types)	–20/+80 °C
E line	(power transmission and layboy tapes)	–20/+70 °C
A line	(all types)	–20/+70 °C
Elastic line	(elastic layboy tapes)	–20/+50 °C
Endless line	(helically wound endless types)	–40/+60 °C

Storage

Store Siegling Extremultus in a cool but not too dry ambience, ideally at a standard environment of 20°C/50 % humidity. When rolled up, do not place material upright on its edge, but hang it with a cardboard core over a pipe or something similar (fig. 1 and 2).

The material – especially the P line – can deform slightly if exposed to humidity or heat from one side. But this deformation will disappear once elongated by 0.2 to 0.4 % so that perfect running is guaranteed.

Tangential belts of the P line are dispatched from our works packaged in special air-tight bags. Do not open these bags until the belts are to be fitted.



Do not subject Siegling Extremultus with G elastomer coating to direct sunlight if at all possible (discoloration).

Tolerances

Production tolerances (lengths)

E/ A and elastic line

300	–	5000 mm	± 0.30 %
5000	–	15000 mm	± 0.20 %
over		15000 mm	± 0.15 %

P line

300	–	5000 mm	± 0.50 %
5000	–	15000 mm	± 0.30 %
over		15000 mm	± 0.20 %

Endless line (helically-wound endless types)

550	–	1000 mm	± 0.50 %
1000	–	5000 mm	± 0.40 %
over		5000 mm	± 0.30 %

Production tolerances (widths)

E/ A and elastic line

10	–	120 mm	+ 0.2/– 0.3 mm
120	–	500 mm	± 1.5 mm
500	–	1000 mm	± 5.0 mm

P line

10	–	50 mm	– 1.0 mm
50	–	120 mm	± 2.0 mm
120	–	500 mm	± 3.0 mm
500	–	1000 mm	± 10.0 mm

Endless line (helically-wound endless types)

20	–	50 mm	± 1.0 mm
50	–	100 mm	± 1.5 mm
100	–	250 mm	± 2.0 mm
over		250 mm	± 3.0 mm

Production tolerances (punching)

P/ E/ A and elastic lines

Diameter of hole	± 0.5 mm
Spacing between holes	± 1.0 mm

The manufacturing tolerances listed depend on manufacturing processes. They do not include any changes in width or length that could occur after manufacture from fluctuations in ambient conditions or other external influences.

The tolerance range may not be increased or decreased at will. Special tolerances are possible. Please consult us.

Standard sizes

Lengths and widths available for belts finished endless
(special sizes available on request)

Length min. [mm]	Width max. [mm]	Splice angle[°]	Types	Thickness max. [mm]
E line (layboy tapes) and elastic line (Z-splice 35 x 5.75 and butt splice)				
320	300		all	
1090	650		all	
E line (power transmission and tangential belts, folder and carrier belts) and A line (Z-splice 70 x 11.5 und Z-splice 110 x 11.5)				
1090	650		all	
P line (wedge splice)				
750	135	60/90	to type 40	4.5
1280	220	60/90	to type 40	4.5
1380	300	60/90	to type 40	5.0
1450	500	60	all	7.5
2000	750	60	all	7.5
3000	1000	60	all	7.5

Availibility

Endless
All lines can be supplied as finished endless belts ready to be fitted.

Open
The P, E and A lines as well as the elastic types are available open as roll material:

	width	max. length
up to	750 mm	150 m
up to	1000 mm	75 m

Prepared
For on-site fittings, the P, E and A lines as well as the elastic types are available prepared:

- cut at 90° or 60° angle
- one end prepared for splicing
- both ends prepared for splicing

On request, our service in your vicinity will carry out belt fitting jobs.

Splicing/equipment selection

Except for the endless line (helically-wound endless types) all construction types can be shortened, lengthened and repaired.

P line with wedge splice
E line with Z-splice
- power transmission, folder and carrier belts with 70 x 11.5 mm pitch
- layboy tapes with 35 x 5.75 mm pitch

A line with Z-splice
- power transmission and tangential belts with 110 x 11.5 mm pitch

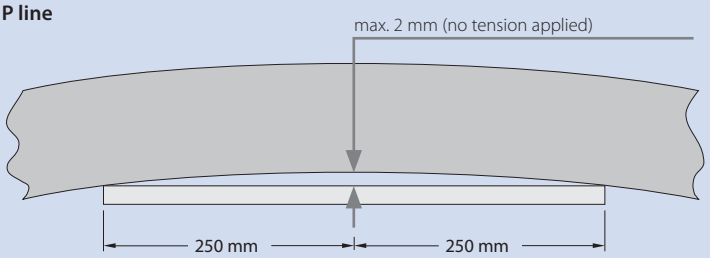
Elastic line
- layboy tapes with Z-splice 35 x 5.75 mm pitch or butt splice.

Soiled belt ends must be cleaned with naphta or white spirits before being spliced. Large scale users may wish to purchase roll material to be spliced on-site.

Detailed information about the finishing equipment and accessories and splicing instructions are available on request.

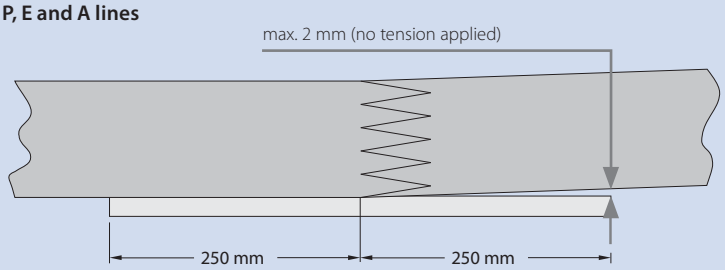
Manufacturing tolerances · Curvature

P line



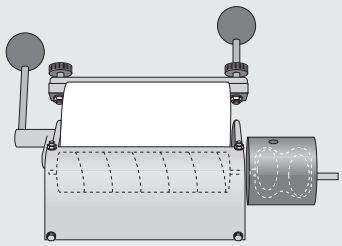
Manufacturing tolerances · Splice

P, E and A lines

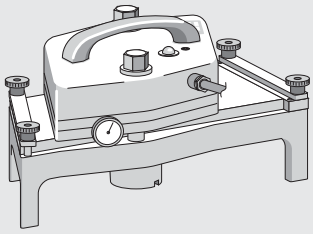


Splicing equipment

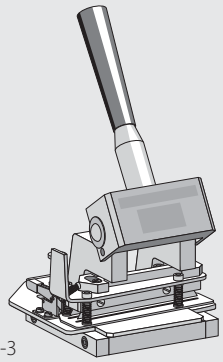
Belt width up to	20 mm	40 mm	60 mm	80 mm	150 mm
Z-punch cutter (Z-splice)					
	–	PP-ZP-V/40-3	PP-ZP-V/80-3	PP-ZP-V/80-3	PP-ZP-V/150-6
Grinder (wedge splice)					
	PG-GM-V/130	PG-GM-V/130	PG-GM-V/250	PG-GM-V/250	PG-GM-V/250
Splice heating device for A line					
– power transmission and tangential belts, belts for live roller conveyors	SMX-HC-130/40	SM-HP-130/40	SM-HP-150/60	SM-HP-150/100	SM-HP-120/150
Splice heating device for E line					
– spindle tapes	SM-HC-50/40	SM-HC-50/60	–	–	–
– layboy tapes	SM-HC-50/60	SM-HC-50/60	SM-HC-50/80	SM-HC-50/80	–
– power transmission belts	SMX-HC-130/40	SMX-HC-130/40	SM-HP-150/60	SM-HP-150/100	SM-HP-120/150
– tangential belts	SMX-HC-130/40	SMX-HC-130/40	SM-HP-150/60	–	–
– belts for live roller conveyors	SMX-HC-130/40	SMX-HC-130/40	SM-HP-150/60	–	–
– folder and carrier belts	SMX-HC-130/40	SMX-HC-130/40	SM-HP-150/60	SM-HP-150/100	SM-HP-120/150
Splice heating device for P line					
– spindle tapes	SM-HC-50/40	SM-HC-50/60	–	–	–
– layboy tapes	SM-HC-50/60	SM-HC-50/60	SM-HC-50/80	SM-HC-50/80 (SB-HP-160/100)	SM-HP-120/150 (SB-HP-160/150)
– power transmission and tangential belts, belts for live roller conveyors, folder and carrier belts	SB-HP-120/50	SB-HP-120/50	SB-HP-160/100	SB-HP-160/100	SB-HP-160/150



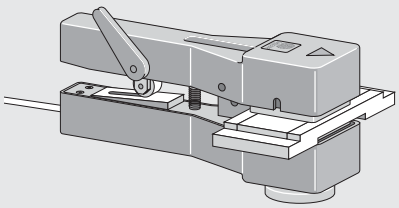
PG-GM-V/130



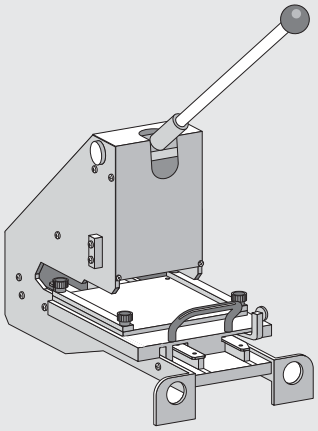
SB-HP-160/150



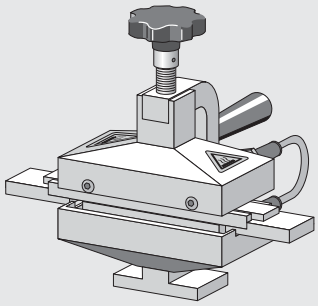
PP-ZP-V/40-3



SM-HC-50/40



PP-ZP-V/150-6

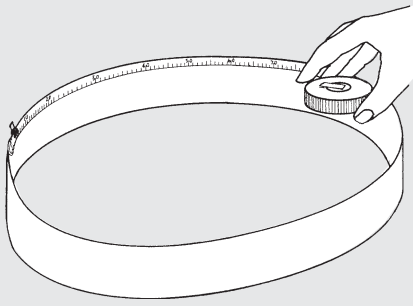


SMX-HC-130/40

Measurement

When ordering belts spliced endless, the length is measured inside, i.e. on the friction coating.

Place the belt on its edge, affix a steel tape firmly on its inside (1) or measure directly over the pulleys (2).a



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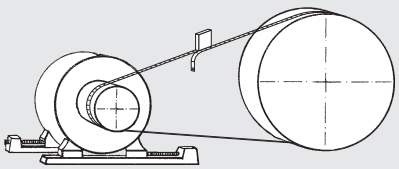

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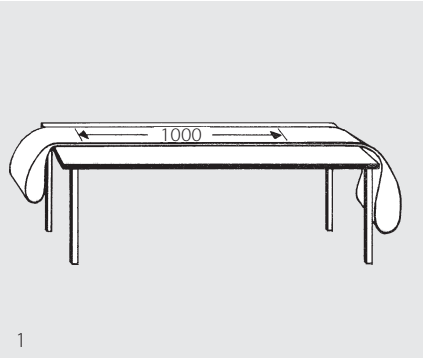
MOVEMENT SYSTEMS

Elongating (tensioning) the belt



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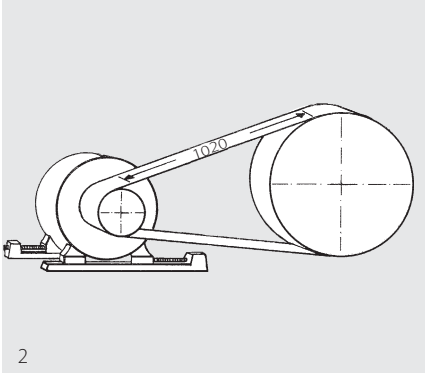

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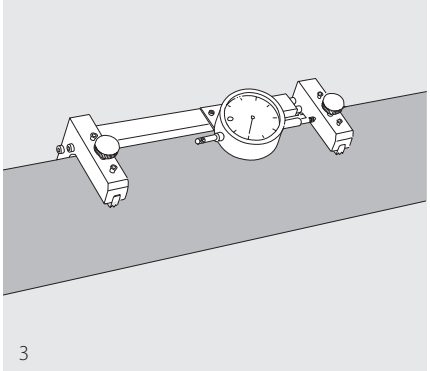
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4 Elongation scale

To be able to transmit a given torque without slip, belts must be elongated (tensioned) sufficiently. The required elongation value is calculated according to the type selected and the belt width and is specified in percent.

Elongating new belts
With the belt placed flat, draw two thin lines (1) on the top side.

After the belt has been mounted on the drive, elongate it by increasing the pulley centre distance (2) until the space between the measuring marks reaches the calculated value. Check the elongation by turning the drive several times and then checking the distance between the measuring marks.

Example: Distance between measuring marks for a required 2 % belt elongation.

relaxed	tensioned
1000 mm	1020 mm
500 mm	510 mm
250 mm	255 mm

To measure the elongation at fitting simply, use an elongation measuring device from Forbo Siegling (3).

Recommended values for the elongation can be found in the table below.

When power transmission and tangential belts of the A and E line are supplied, the elongation value is specified on request. To simplify tensioning, these types are available with measuring marks already applied. After the belts have been tensioned and the belt rotated several times, the elongation is checked using the elongation scale provided (4).

Elongating belts which have been in use
If an belt which has been in use is taken off it must be put back on at the same tension. For this reason it is recommended that, prior to removing the Siegling Extremultus belt, the operating position of the motor be marked on its base plate or mounting block or defined measuring marks be applied to the belt.

Caution!
The recommended elongation values are specified assuming that the belt has been sized correctly! If a belt has been sized too heavily, it requires a correspondingly smaller amount of elongation (tension) so that the admissible shaft load is not exceeded.

Recommended values for elongation (%)

Line	Function	Uniform loads	Intermittent loads	Severe intermittent loads
P-Line	Power transmission belt Tangential belt	approx. 2.0 2.0 – 2.8	2.0 – 2.5	2.5 – 3.0
E-Line	Power transmission belt Tangential belt	1.0 – 2.0 1.5 – 2.0		
A-Line	Power transmission belt Tangential belt	0.3 – 0.8 0.3 – 0.8		
Elastic Line	Layboy tape	3.0 – 8.0		
Endless-Line (helically-wound endless types)		0.5 – 1.0	1.0 – 1.5	1.5 – 1.8
P, E, and A Line	Folder and carrier belt Layboy tape Belt for live roller conveyor	Tension just enough to ensure they perform the proper function		

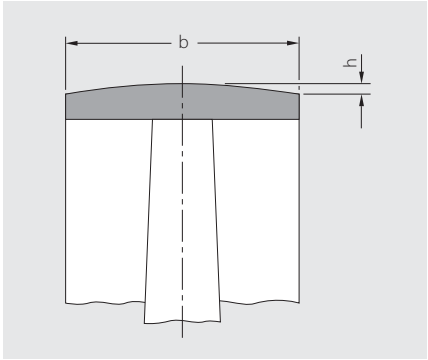
Flat belt pulleys (design)

The use of flat belt pulleys in accordance with DIN 111 or ISO/R 100 ensures a long belt service life, highest efficiency, proper belt tracking and low shaft loads.

The crown height values recommended by ISO and DIN are not absolutely identical.

According to these standards, the crown should have a finish $R_z \leq 25 \triangleq R_a$ 6.3 (as per DIN 4768).

Solid and plate pulleys can be used for speeds up to $V_{max} = 40$ m/s. Special pulleys must be used for higher speeds (e.g. steel, counter-balanced).

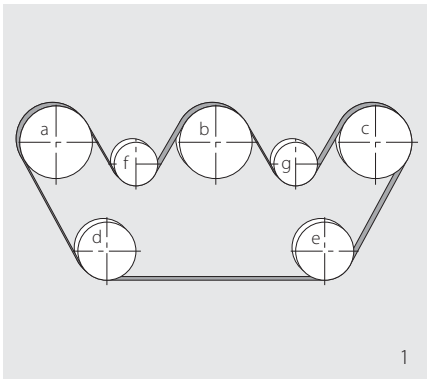


Crown height „h" [mm] as per DIN 111

Belt pulley diameter [mm]			Belt pulley width b [mm]	
			< 250 h	>250 h
40	to	112	0.3	0.3
125	and	140	0.4	0.4
160	and	180	0.5	0.5
200	and	224	0.6	0.6
250	and	280	0.8	0.8
315	and	355	1.0	1.0
400	to	500	1.2	1.2
560	to	710	1.2	1.2
800	to	1000	1.2	1.5
1120	to	1400	1.5	2.0
1600	to	2000	1.8	2.5

For drives with horizontal shafts with ratios of more than 1:3, the smaller pulley can be cylindrical.

For drives with vertical shafts both pulleys should be crowned in accordance with DIN or ISO regardless of the transmission ratio.



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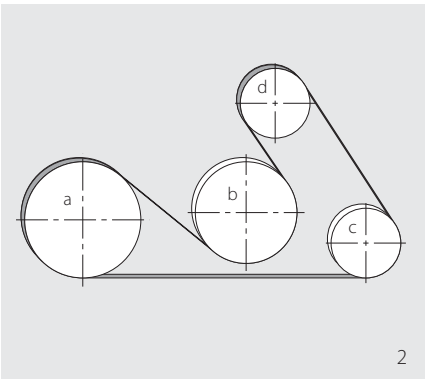

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As a general rule only those pulleys should be crowned which bend the belt in the same direction (these are usually the pulleys located „inside"). It is sufficient in most cases to crown only the largest of the pulleys in order to achieve safe tracking.

In example 1, it is recommended to crown pulleys a, b, c, d and e. With shorter belts, however, it is sufficient to crown only pulleys a and c.

In example 2, it is recommended to crown pulleys a, c and d. With shorter belts, however, only pulley a would normally be crowned.

Maintenance

GT, GG, TT, TG, TU, UU, NN, UG, PU and PP belts are maintenance-free.

G elastomer, urethane and fabric surfaces must be kept free of grease and oil to ensure they function properly.

They must not be treated with belt cleaning agents.

With LT and LL belts, treat the L chrome-leather friction faces with Siegling Extremultus spray conditioner. This only treats the leather and does not increase the efficiency.

Aligning and fitting

Aligning of pulleys and shafts
Make certain that pulley faces are clean of anti-corrosion agents, dirt and oil.

Before fitting Siegling Extremultus check parallelism of shafts and align pulleys, adjusting in accordance with manufacturer's instructions as needed.

Fitting
Note: Never wind Siegling Extremultus belts over pulley edges or use accessories which cause edge damage and result in creasing or tearing of the belt.

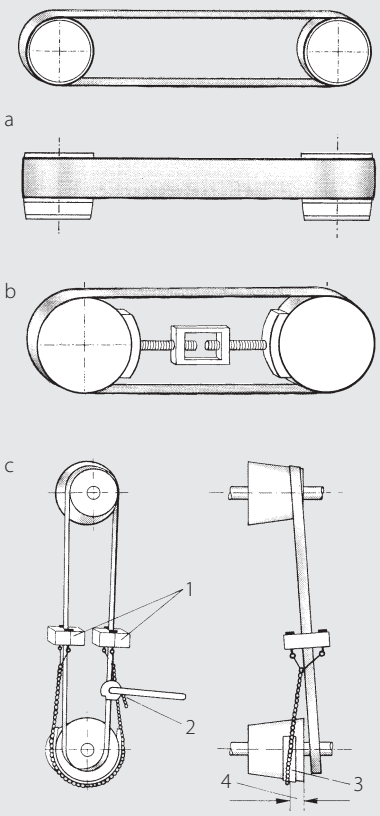
Types from the A line are particularly susceptible to this kind of damage (due to their aramide tension members).

– variable centre distances
When fitting the belt, follow the instructions specified by the machine manufacturer.

In most cases the centre distance can be decreased sufficiently to fit the belt by adjusting one pulley.

– fixed centre distances
For drives with fixed centre distances, the belt length must be selected such that the necessary elongation has been achieved after fitting.

In such cases, use either mounting cones (a), screw jack (b) or chain hoist (c – only for the P line).



c:
1 Clamps
2 Chain hoist
3 Protective layer (piece of belt)
4 Belt width (approx.)

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MOVEMENT SYSTEMS

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