

# Telescopic covers

## Perfect protection for guideways on machine tools

Wherever guideways on machines have to be protected, we have a suitable solution. Our guideway protection systems boast a high degree of operational reliability, a long service life, and make use of innovative technical solutions.

## Every production machine requires protection for its guideway

Today, modern machine tools process workpieces at ever-greater cutting and travel speeds. The protection of guideways, measuring systems, drive elements and other vulnerable parts is absolutely essential.

Accelerations and speeds of machines are constantly increasing. Telescopic covers must also be able to cope with these challenges. This is where telescopic covers with harness mechanisms are used.



■ Telescopic cover for lathes



■ Telescopic cover at a milling machine

## From individual manufacture to series production – we have a solution

The number of varieties is immense – no cover for a machine is exactly the same as any other.



■ Telescopic cover with flat shape on a boring machine



■ Special form of an inclined bed cover on a test framework

## Designs and areas of application

Until the 1970s, telescopic covers seldom moved in speed ranges any greater than 15 m/min.

The expansion and compression of the individual boxes took place sequentially. Due to the low speed, there was hardly any impact pulse that caused interfering vibrations.

Over the years, however, improvements in drive technology have increased the travel speeds of the machines and thus also the speeds of the cover.

At high running speeds the impact pulses affecting the covers are enormous. This creates high impact noise and machine vibration. Furthermore extreme mechanical stress is exerted on the telescopic cover.

The landscape for telescopic covers has changed greatly in the last few years.

“Old” designs are less and less in demand, with modern concepts such as covers with differential drives taking their place.



■ Cross-beam cover at a milling machine



■ Telescopic cover at a milling machine

Telescopic covers are generally produced from cold-rolled uncoated thin plates in thicknesses from 1 to 3 mm.

In case of extremely aggressive environmental conditions (e.g. aggressive cooling lubricants), corrosion-resistant stainless steel plates may also be used.



KABELSCHLEPP GmbH Hünsborn develops and produces guide track protection systems for different axes of the machine, to customer specifications.

Subject to change.

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Enquiry forms – page 608

# Telescopic covers

## The speed is decisive

At speeds below 15 m/min a telescopic cover can still be built in the conventional form of box synchronization. At high running speeds the inevitable impact pulses lead to vibrations and clearly audible impact noise.

So-called differential drives serve to synchronize the boxes and eliminate impact pulses. KABELSCHLEPP has decided on the tried and proven harness mechanism principle for which special materials are used.

## Telescopic cover with damping elements



1 Wiper systems in various designs



2 Rollers



2 Sliders



3 Gully in various designs



4 Damping systems in various designs



5 Structural metal plates to prevent slipping (on the largest box)



6 Lifting element



7 Locking system

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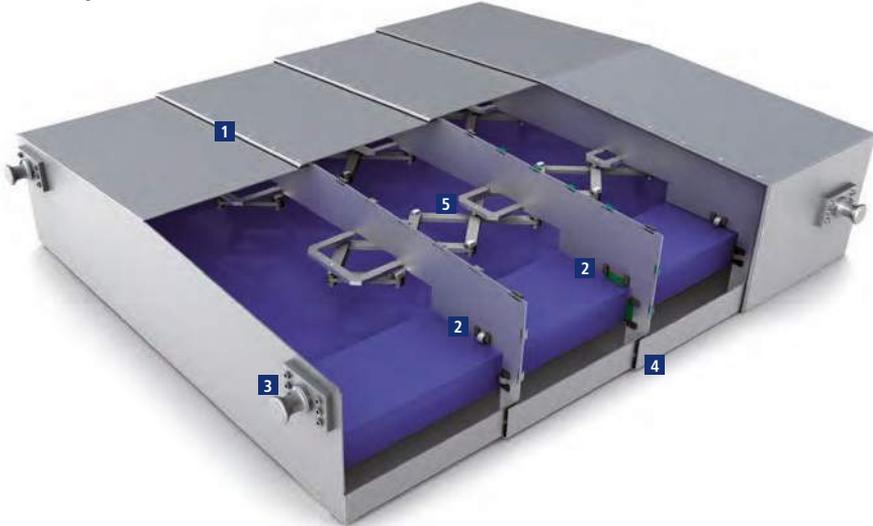
Enquiry forms – page 608

Travel speed	Damper elements / harnesses
Up to 15 m/min	Not required
Up to 30 m/min	Damper elements
Up to 60 m/min	Damper elements / harnesses

The use of damping elements depends on the travel speed and the moving mass. The information in the table should therefore only be viewed as guide values.



## Telescopic cover with harness mechanism



1 Wiper systems in various designs



2 Rollers



2 Sliders



3 Lifting element



4 Locking system



5 Synchronising device (harnesses)  
for fast-running telescopic covers

# SXM – Mechanical elements with harnesses

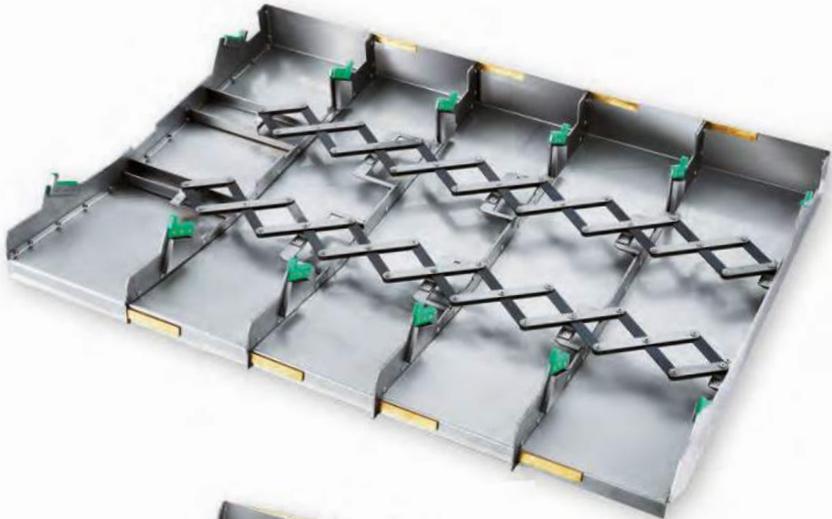
## KABELSCHLEPP sets the mark

To ensure impact-free expansion / compression of telescopic covers, they are used with so-called synchronisers (harnesses).

As a result, all of the cover boxes move evenly during expansion and compression. The individual boxes move relative to each other only at a differential speed.



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■ Telescopic cover with proven harness mechanism in various expansion states.

**SXM**  
 KABELSCHLEPP  
 Synchronized Expansion Mechanism

**SXM – Synchronized Expansion Mechanism.**  
 The KABELSCHLEPP harness technology is used wherever you find this symbol.

### Telescopic covers with harness mechanisms have many advantages:

- High travel speeds up to 200 m/min are possible.
- The **force peaks** that would normally occur when the telescopic covers dashed against each other **do not occur**.
- The disruptive **impact pulse** of the boxes is **eliminated**.
- **Acceleration forces** and speeds are **uniformly distributed across all the plates**. This also applies to the resultant inertial forces.

## Cover with two harnesses

This solution has been developed for travel speeds greater than 100 m/min. Two harnesses ensure synchronization. In the example shown here the cover plates are made of 1 mm thick stainless steel.

The cover plates are riveted to the rear wall. Welding and the resulting heat effects have been avoided. Only the wiper is spot-welded.

**SXM**  
KABELSCHLEPP  
Synchronized Expansion Mechanism



■ Telescopic cover with proven harness mechanism

## Cover with one harness

This particularly lightweight solution has been developed for "small" machine tools. The cover plates are made of 1 mm thick normal steel.

The travel speed in this special application is only 30 m/min. The harness mechanism serves to ensure synchronization, however, and the reduced mass of all the elements means that it was possible to develop an especially cost-effective solution here.



■ Telescopic cover with only one harness



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# Telescopic covers

Perfect protection for guideways on machine tools



Photograph: Heinrich Georg GmbH Maschinenfabrik

## Designs

Machine tools come in a wide variety of designs. That is why a modern lathe needs another type of telescopic cover than, for example, a large

bed-type milling machine. The following designs provide an overview of typical designs.

### Flat shape

The U-shaped design is generally used in a horizontal, lying position for milling table guides. With this design the maximum width of the telescopic cover should be limited to 1.5 m.

### Roof shape, centric (eccentric)

This design is always advisable when cooling lubricants are used. The inclined surface allows the water – and naturally also the chips – to run off more easily. With large covers (> 3 m width) for reasons of stability, etc. at least three roof angles should be provided.



## Flattened roof shape

The flattened roof shape is a special construction method with two roof angles. Primarily for dry operation and widths > 3 m.



## Shape with incline to one side

The shape with incline to one side has a special roof shape. Depending on the possible incline, covers can be constructed with widths of up to 1.5 m. This shape is likewise a recommended solution when large amounts of coolant are present.

Depending on the angle of incline, this form also helps to discharge coolants / chips.



## Vertically-installed telescopic cover

Standing covers are used on larger machine tools, mostly in the area above and below the cross beam. They can take many different shapes.



## Blind cover

With blind telescopic covers, the cover plates move in separate guide rails, each of which is mounted on the machine at the sides. It is used exclusively in a vertical arrangement. The guide rails are generally made of brass.



## Cross-beam cover

These covers are predominantly used on large gantry machine tools on a cross beam to the left and right of the support. The boxes are suspended vertically and protect the support guides from chips and cooling lubricants.



## Tubular cover, polygonal cover

Tubular covers or covering shafts, spindles, etc. They can be made either with a round or a polygonal shape.

The round shape is possible up to a tube diameter of 120 mm, for bigger diameters one should choose a polygonal guide. Subsequent installation on the spindle without disassembly is the advantage of the polygonal guide.



Other forms and special designs tailored to your specific requirements are possible. Please do get in touch with us, we will be happy to advise you!

## Wipers on telescopic covers

Wipers on telescopic covers keep the cover boxes clean and prevent the penetration of dirt and chips.

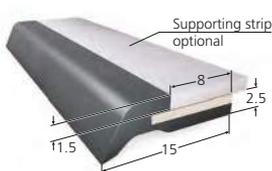
### Welded-on and riveted-on wipers

With these types the support profile is spot-welded or riveted to the cover box.

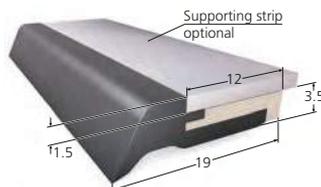
#### Type MA 8 / MA 12

These wipers consist of an NBR profile vulcanized onto a steel strip.

Necessary calculated distance of the cover plates 2.5 to 3.5 mm.



■ Wiper type MA 8



■ Wiper type MA 12

#### Type MA 8S / MA 12S

Wipers MA 8 and MA 12 are covered with a protective strip for protection against hot chips.

Necessary calculated distance of the cover plates 3.5 to 4 mm

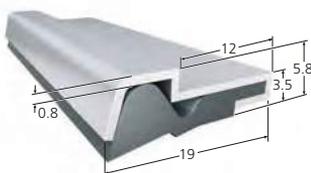


■ Wiper type MA -S

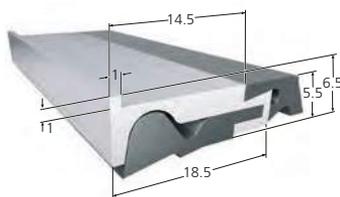
#### Type MA 12.1 / MA 18

A specially-milled steel plate profile is spot-welded to the boxes and a PUR wiper lip is inserted.

Necessary calculated distance of the cover plates 3.5 to 5.5 mm.



■ Wiper type MA 12.1



■ Wiper type MA 18



## Welded-on and riveted-on wipers

### Steel plate wiper made of spring band steel

A specially shaped, approximately 0.4 mm thick, approximately 25 mm wide band of stainless spring band steel is spot-welded to the cover plate. This wiper is recommended for dry machining.

Necessary calculated distance of the cover plates 1 mm.



## Types with replaceable wiper lips

### The replaceable wiper with a PU lip

This new generation of wipers can be replaced directly on the machine, without disassembling the telescopic cover.

The wiper lips have good gliding characteristics and are also usable where little lubricant is generated, e.g. on machine tools.

Turn-lock fasteners fasten the wiper to the cover plates. With a 90° turn of the turn-lock fasteners the wiper is locked or released. In this way the system can be easily switched out for fresh parts.

Necessary calculated distance of the cover plates 4 mm (VA 12 G) and 6 mm (VA 17 G).



■ Wiper type VA 12 G



■ Wiper type VA 17 G

## Damping elements on telescopic covers

Telescopic covers with travel speeds greater than 15 m/min must be provided with dampers in order to reduce impact pulses.

### Wiper type MA 18 with damping

The support profile is made of aluminum and is screwed or riveted on. The wiper lip is identical to MA 12.1. The special damping profile can be installed in the rear aperture formed onto the support profile.

Necessary calculated distance of the cover plates 5.5 mm.



### Brass strips with damping

Brass strips are used primarily on standing covers. The damping profile described above can likewise be mounted on an appropriately drawn brass profile.

Necessary calculated distance of the cover plates 5.5 mm.



### Progressive damping element

In order to reduce impact pulses effectively, progressive damping elements can be installed in the rear walls of the covers. Depending on application and running speed the number of dampers is varied in order to achieve an optimal result.



## Splash- and hose-proof protection on telescopic covers

Over time cooling emulsion and fine chips can be “pumped” under the individual boxes and make it over the rear wall into the machinery space that is being protected. In many cases this is undesirable. Machine tools with hydrostatic bearings require “watertight” covers.

### Gullies for telescopic covers

In order to catch coolant and chips that make it over the rear wall, a gully is generally installed on the back of the rear wall. This gully allows the fluids to be drained off to the sides.

#### Aluminum gully type AL 19

This gully is an extruded aluminum profile which is screwed onto the rear walls of the cover.

The cover plate is bent downwards so that it projects into the gully. This allows the coolant between the plates to flow into the moulded gully.

Condensation water that forms under the cover plates is wiped off by a lip and drained into gullies to the front and back. This makes it possible to achieve a very high level of waterproofing.



#### Gully type ST 05

This gully is screwed onto the rear wall. This has the advantage of, among other things, meaning that galvanized metal plates can be used (no welding necessary).



#### Condensation gully type ST 05 K

This gully is based on the proven type ST 05. An upward extending sealing membrane made of flexible synthetic moves in both directions catching the condensation and directing it into the drain gutters. From there it flows automatically into the side drains.



## CROSS-COVER covers

### Even longer service lives for horizontal machines

Wherever for example machining spindles of horizontal drilling machines move with high accelerations and speeds, horizontal and vertically moving cover elements are needed.

With the second CROSS-COVER generation you likewise receive a ready-to-install cover unit that is movable in two dimensions. They are adapted individually to your application and delivered ready to install.

Our reworking of its proven design has improved its dynamic characteristics and extended its service life.



#### Re-Design CROSS-COVER

- Higher travel speeds and accelerations possible
- Longer service life
- Lighter thanks to optimized design
- Protection against spray water according to IP X5
- Size selections available on short notice

### Re-Design CROSS-COVER

With the second CROSS-COVER generation the use of gliding and guide elements and the systematically weight-optimized design have made possible even higher travel speeds.

In addition to improvement of the dynamic characteristic values through reduction of the moving masses, the covers are even more durable. They provide the same high penetration resistance as the service-proven system.



■ CROSS-COVER in various expansion states



# SXM

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Synchronized Expansion Mechanism

## SXM – Synchronized Expansion Mechanism

### Impact-free travel of the cover elements

To ensure impact-free expansion / compression, synchronizers (harnesses) are also used in the revised design.

## Protection against spray water acc. to IP X5

The CROSS-COVER covers meet the requirements of protection class IP X5 (Ingress Protection – protection against hose water).

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Enquiry forms – page 608