CARPET TWISTER.
CARPET CABLER.
FOR PERFECT CARPET YARNS.

TWISTING CARPET YARNS.
Competence in Twisting.

Twisting and cabling systems

Allma in Kempten and Volkmann in Krefeld form the Allma Volkmann Business Unit in the Saurer Group. Allma and Volkmann are leaders on the global market for twisting and cabling technology.

At our site in Krefeld, we develop, produce and market twisting and cabling systems for staple fibre, carpet and glass filament yarns throughout the world. We enjoy an excellent reputation as provider of complete solutions and comprehensive systems. Our products are the result of the wealth of experience gained over many generations in combination with the know-how of today for the textile industry of tomorrow. Here, tradition and the latest technology merge to form a symbiosis of expertise, quality and reliability.

Our aim is to continuously develop innovative and cost-effective products at the highest level for the benefit of our customers. Our core competencies also include the technical/textile support service we provide, together with a high degree of customer proximity resulting from our globally networked service organisation, as well as the fast and customer-focused supply of original parts.
CarpetTwister / CarpetCabler

Volkmann has been the leading international supplier of twisted yarn and cabling systems for many years. The Volkmann carpet machines Carpet-Twister and CarpetCabler have been successfully used for decades to produce high quality, premium yarns for quality carpets and other textiles. Our energy-saving family of spindles with various types of spindle and matching spindle pot diameters can achieve energy savings of up to 40%. For the manufacture of carpet yarns, Volkmann offers an optimum of variability and flexibility with these twisted yarn and cabling systems.

Main highlights are:

- Reduction of set-up times by assembling tested sections
- One drum shaft per side with individual spindle tape drive
- Dual cam gearbox with mechanical or electrical drive system
- Delivery speed of up to 120 m/min
- Spindle speed up to 8000 rpm
- Number of spindles up to 176 per machine
- Monitoring of the yarn path via pneumatic differential yarn sensor
- Operation via the knee lever and multifunction switch
**E³ – Triple added value**

We aim to provide our customers with innovative products that make a difference in their production and profitability. The passion for our products drives our innovation. By focusing on our customers’ requirements and combined with Saurer’s philosophy of innovation and sustainability, triple added value has been created.

**Energy**
- Up to 40% of energy can be saved by the energy-saving family of spindles and by efficient drive and bearing technology
- Air conditioning costs are reduced as less energy is consumed

**Economics**
- Up to 30% higher productivity by delivery speeds of up to 120 m/min when up-twisting
- Up to 10% less space needed due to closer spindle spacing
- Up to 5% higher production speeds due to low yarn balloon tension

**Ergonomics**
- Up to 10% less time needed to operate the machines thanks to central settings and numerous handling aids
- Package conveyor belt to rapidly clear away the finished packages
Drive concept

CarpetTwister and CarpetCabler from the Volkmann Product Line have been successfully used for decades to produce high quality, high economy yarns for quality carpets and other textiles. The universal hollow-shaft spindle allows the simple conversion from the two-for-one method to the cabling method and vice versa.

The tried and tested individual spindle tape drive and dual cam gearbox generate yarn take-up speeds of 8000 rpm and delivery speeds of up to 120 m/min. These main features stand for an absolutely robust drive concept.

Drive power

In the drive section are the two main drive motors, together with the drive electronics and the operating and display units.

They drive the drum shaft for the individual spindle tape drive on each machine side via a gear unit.

The spindle speed can be adjusted by changing the drum belt pulley, or can be optionally set infinitely variably with a frequency inverter via a potentiometer.

Operating elements and displays

The operating panels are arranged on the face of the drive section on each machine side.

Standard version:
- Display unit for
  - spindle speed
  - production speed
  - amount of twist
  - crossing angle
  - time and length switch-off
  - operating hours counter
- Fault indicator
- S/Z key switch with indicator lamps
- Start button
- Stop button
- EMERGENCY STOP mushroom button
- Pressure indicator, Volcojet or Creeljet
- Pressure indicators for pneumatic yarn path monitoring

Special version:
- Potentiometer
- Ammeter
- Switch cabinet ventilation ON
- Shift yardage counter
**Individual spindle tape drive**
The universal individual spindle tape drive is designed to provide absolute reliability and ensures that all of the driven spindles run precisely synchronised. A further advantage of this type of drive lies in the consistent isolation of the textile area from the drive area to prevent the possibility of yarn contamination.

- Drive power by means of a shaft assembly with drum pulleys
- Automatic spindle stop in the event of sliver runout or yarn break, triggered by the yarn path monitor
- Independent of this, the spindle can be shut down via the multifunction switch

**Main advantages of this drive concept**
- Independent machine sides
- Robust mechanical drives
- Flexible and economical machine design
- Tried and tested yarn-guidance components for high yarn quality
- Best cross-package quality
- Simple machine operation and maintenance

**Mechanical gearbox**
The solid dual cam gearbox makes different take-up speeds possible for each machine side. The robust traverse guide cam drives the traverse guide rod and realizes take-up speeds of up to 120 m/min. This area is equipped with an oil circulation system. The interference pulse of the anti-patterning device is controlled electronically. The interference pulse is only suppressed at the edge of the winding stroke, resulting in perfect take-up package edges and optimum package unwinding during further processing. Handling for setting work is practically solved. The yarn twist, crossing angle and overfeed speed are set on the freely accessible end of the machine. Both areas are designed oil-free, which makes the setting operation easier.
Options for increasing machine availability

Computer-controlled electro-mechanical gearbox (optional)
This computer-controlled drive system is the perfect solution to the market’s requirement for fast, effective adjustment to a new yarn batch, accompanied by increased machine availability of +1.8%/year, 130 hours (*).

Access and adjustment to a new production parameter, such as:
- Amount of twist
- S/Z direction of rotation
- Spindle speed
- Length and time-based shut-down

can be performed by authorised personnel on the central computer’s touchscreen.

It is also possible to choose an optional performance display for current energy consumption and a maintenance display with a reminder function.

The production parameters entered can be stored in an article library and called up whenever required. Delivery speed and operating hours, as well as manually entered adjustment values can also be called up.

The computer is equipped with a USB connection.

Frequency inverter for the spindle drive
With an electronically controlled frequency inverter, the spindle can be set to any speed, without the need to change pulleys, meaning that the most economical speed can be selected.
- Simple, infinitely variable adjustment of the spindle speed
- Fast batch change by calling up stored batches or new entries
- Spindle speed of 8000 rpm and higher (dependent on yarn)
- Machine availability +1.8%/year, 130 hours (*)
Conclusion

We provide our customers with detailed benefits to increase machine availability.

The modular set-up of the options, from the drive concept to the efficient central adjustment of the individual machine components enable flexible use of the machine in all production scenarios.

These benefits become particularly noticeable when adjusting the machine and changing batches, thereby significantly increasing the benefit to the customer.

Pneumatic creel and centrally adjustable creel yarn brake

The pneumatic creel reduces mechanical raising and lowering during placement. The creel yarn brake, which is centrally adjustable on each machine side, reduces machine downtime during batch changes.

- Constant and homogeneous unwinding, even with unevenly extracted yarn
- Machine availability +1.2%/year, 85 hours (*)

Centrally adjustable yarn balloon guide

An optimum, uniform height position on all yarn balloon guides results in optimum, low energy consumption of the spindles.

- Centrally adjustable on each machine side
- Fast, simple and precise motor-driven drive for an optimum height position
- Machine availability +2.4%/year, 175 hours (*)
Energy-saving family of spindles

- Energy savings due to various types of spindle with matching spindle pot diameters

**Spindle 285 = -15%**
The energy-optimised spindle reduces energy consumption by up to 15%.
The standard feed packages can be used for up-twisting as well as for cabling. Thanks to the optimised spindle geometry, the yarn count range is suitable for all main yarn counts. The 285 spindle can also be used for all typical applications.

**Spindle 260 = -35%**
In many markets, feed packages up to 260 mm are used. With the newly optimised spindle/pot geometry, up to 35% of energy can be saved. All major yarn counts can be processed during up-twisting and cabling and production costs can be significantly reduced.

**Spindle 220 = -40%**
With the new 220 spindle, you save up to 40% of energy, particularly with cabled yarns. This means a quantum leap in cost-effectiveness. The production process requires adapted package diameters here, which leads to an improved production sequence and ideal package sizes.

**Advantages of the spindles:**
- Less energy per spindle
- Reduced energy consumption per kg
- Higher production per unit area
- Optimum yarn grade
- More flexibility
Machine cross sections

Two-for-one twisting and cabling process

In the two-for-one twisting process, each mechanical spindle revolution results in two twists in the strand. With the direct cabling process, two yarns are twisted around each other in a single step without the individual strands themselves being twisted.

1. Yarn path
2. Twisting/cabling spindle
3. Spindle pot
4. Balloon limiter
5. Cabling tension hood
6. Yarn brake and flyer
7. Knee lever for yarn threading
8. Yarn balloon guide
9. Separator
10. Differential yarn sensor with spindle start/stop switch
11. Deflection roller
12. Overfeed roller
13. Traversing mechanism
14. Package lift-off paddle
15. Friction roller
16. Cradle
17. Yarn guide tube
18. Hi-Lo creel with brake
Twisting, up-twisting or cabling

Configuration options for the processes

Universal hollow-shaft spindle
The universal hollow-shaft spindle of the CarpetTwister and CarpetCabler allows the simple conversion from the two-for-one method to the cabling method and vice versa. Gentle yarn guidance is ensured by high-quality, wear-resistant surfaces along the yarn path. The ideal design of the spindle pot allows a maximum number of feed packages.

Hysteresis brake
Calibrated, high-precision Volkmann hysteresis brakes have been specially developed for processing carpet yarns in the direct cabling process. They are designed to accommodate the entire customized count range of the yarn grades likely to be processed. These brakes ensure homogeneous yarn grade from point to point, thanks to the high-quality, wear-resistant yarn guide elements.

Ball yarn brake
The proven ball yarn brake for the two-for-one twisting process covers the entire range of yarn tension. Changing to another tension capsule, as with conventional capsule yarn brakes, is no longer necessary. The braking force can be adjusted in 24 levels in seconds without taking further steps, and the brake adjustment mechanism is also readily visible, even during processing. The automatic and proven Volcojet air-threading system drastically reduces set-up times.

The advantages of the ceramic ball are:
- Low weight
- No corrosion
- Almost no wear
**Mechanical Hi-Lo creel**
The creel is spring-supported, which offers the following benefits:
- Ergonomic fitting position
- Simple high/low operation
- Robust and reliable
- Automatic locking
- Optimised yarn path
- 2- or 3-peg plug-in versions
- Extra plug-in options for alternative customer requirements

**Option**
Hi-Lo creel with pneumatic support for optimized ergonomics.

The standard dual capsule brake for precisely setting the yarn tension can be used universally. Apart from these brakes, the following, optional creel yarn brakes are available:

**Creel – Ball yarn brake**
Good simultaneous readability of the inner yarn and outer yarn brake.

**Roller yarn brake**
A pneumatically adjustable roller brake is available as a creel yarn brake for minimum handling times.

**Hysteresis brake**
In addition to the proven hysteresis brake for pot feed packages, a special, graduated hysteresis brake for use in creels has been developed for the most exacting demands.

The advantages are:
- The transfer tail can be adjusted during strobe observation
- The creel does not have to be lowered (increasing machine availability)
- No separate threading because of Creeljet

The advantages are:
- Centrally adjustable on each machine side
- Reduced set-up times
- Very even yarn withdrawal
- Optimum unwinding conditions
- Reproducible take-up forces

The advantages are:
- High precision
- Simple and fast adjustment
- Wear-resistant and robust yarn guiding elements
- Absolute reproducibility from brake to brake
The spindle area

Creel-Jet and Volcojet

Tried and tested for decades, these pneumatic threading systems are activated by means of a knee lever. They make a significant contribution to reducing the operating time.

Creel-Jet (option)
The Creel-Jet is the pneumatic threading system at the direct cabling spindle.
On initiation of the threading operation, the negative pressure generated causes the creel yarn to be sucked through the yarn guide tube and the hollow shaft of the spindle. The jet of air then guides the yarn around the spindle pot and back to up where it can again be easily grasped by the operator.

Volcojet (option)
The Volcojet is the proven threading system on the Two-for-One spindle. The fed compressed air pulls the yarn through the hollow shaft, whereby it automatically passes the brake without any additional handling. The jet of air then carries the yarn around the spindle pot to the top. The yarn thus be easily grasped by the operator.

Knee lever
Knee lever operation achieves an ergonomically optimised workflow and improved posture at work.

Floor clearance
Thanks to the knee lever, there is free clearance between the floor and machine. The area under the machine is accessible and easier to clean.

High-speed elements for up-twisting (option)
Specially designed unwinding aids allow the processing of up-twisted articles with low amounts of twist and high take-up speeds. When an inner balloon is formed, resulting from very high unwinding speeds, the protective hood ensures that inner balloon and outer balloon are separated.
The take-up area

Sensing, clamping and cutting device
In the event of a yarn break, this is clearly indicated by a visible signal, the remaining yarn is clamped and cut, and ancillary functions, such as spindle stop and take-up package lift-off, are activated. This monitoring system can be centrally adjusted to the yarn tension for each machine side, and also responds to an overload if, for example, the yarn is entangled. The new, compact design also includes the multifunction switch for starting and stopping the spindles and provides even more free space for loading the spindles. There is also a reset option, integrated for the length shutdown for each spindle with TwistControl.

Cradle in four-joint design
High take-up speeds are possible thanks to the stable cradle design. Packages with a max. diameter of 400 mm can be produced. A contact pressure adjustment system ensures a uniform winding density.

Centring discs
Easily replaceable and dirt-resistant centering discs mounted on ball pins allow simple and fast change-overs on various tube or cone types. Furthermore Volkmann ensures customized optimization of the required centering discs.
Your safety

**Package lift-off paddle**
With this accessory, the spindle is automatically stopped when a feed package comes to its end or in the event of a yarn break. After a delay, a paddle lifts the cross-package from the friction roller and stops it. This prevents rubbing on the wound yarn surface and safeguards the original quality of the cross-package.
These functions are triggered automatically by the yarn path monitor.

**Safety cover with transfer tail**
The overfeed unit and take-up package drive section are completely covered. That increases safety at work. A yarn guide element facilitates the production of the transfer tail.

**New magnetic safety equipment (optional)**
In addition to the plasma-coated standard friction rollers and pre-take-up rollers, Volkmann provides newly developed safety equipment with automatic self-activation for overloads.

The pre-take-up roller can be chromed-plated or have a heavy-duty plasma coating. The new friction roller is equipped with a centred or full-surface plasma coating.
Handling and quality features

Package conveyor belt
In order to improve the ergonomics, the package conveyor belt has been designed so that cross-packages can be removed laterally at the belt exit point. This measure allows for a further reduction in operating times in combination with easier operator workloads when handling large volumes of yarn.
The package conveyor belt can also be used as an interim storage facility for cross-packages. A light barrier at the end of the conveyor belt allows packages to be removed in cycles.

Other advantages include:
- A wider conveyor belt, designed for removing the cross-packages of a complete machine side
- Concave guide rail prevents the jamming of packages and tubes as well as the formation of trailing ends
- Optionally available slides at the end of the conveyor belt are available for continuous removal

Frequency inverter (optional)
With an electronically controlled frequency inverter, the spindle speed can be smoothly adjusted, so that the most cost-effective speed can be selected without changing the belt pulley.
The mechanical change to another spindle speed is omitted, which reduces the set-up time of the machine.
This is especially useful to the customer when processing small batches.

TwistControl (optional)
The central TwistControl control unit is located at the front of the drive section and is used to control and monitor the length shut down function and to monitor the speed.
A touchscreen is used to operate the system.
System handling is self-explanatory thanks to menu-guided operation in the form of pictograms.

Main advantages:
- Length measurement for each spindle
- Speed monitoring for each spindle
- PDA functions
Technical and textile data

**Twist range**
Cabling: 21 to 355 t/m  
0.5 to 9 t/inch

Twisting: 41 to 710 t/m  
1 to 18 t/inch

**Yarn count range** (depending on the type of spindle)
Cabling: 400 to 5000 dtex
Twisting: Nm 2/2 to 28/2

Spindle speed: up to 8,000 rpm
Delivery speed: max. 120 m/min

**Creel feed packages**
Winding stroke 254 mm  
max. package diameter 285 mm  
max. tube length 290 mm  
minimum tube I.D. 73 mm  
net yarn weight approx. 5.5 kg

**Pot feed packages**
Spindle 285
Winding stroke 254 mm  
max. package diameter 285 mm  
max. tube length 290 mm  
minimum tube I.D. 73 mm  
net yarn weight approx. 5.5 kg

Spindle 260
Winding stroke 254 mm  
max. package diameter 260 mm  
max. tube length 290 mm  
minimum tube I.D. 73 mm  
net yarn weight approx. 4.8 kg

Spindle 220
Winding stroke 254 mm  
max. package diameter 220 mm  
max. tube length 290 mm  
minimum tube I.D. 73 mm  
net yarn weight approx. 3.3 kg

**Take-up packages** (different tube types on request)
**Cylindrical cross-wound package:**
Winding stroke 254 mm  
max. tube length 290 mm  
minimum tube I.D. 73 mm  
max. package diameter 400 mm

**Tapered, cross-wound package:**
Winding stroke 254 mm  
max. tube length 290 mm  
minimum tube I.D. 33 mm  
max. package diameter 400 mm
### CarpetTwister / CarpetCabler, spindle gauge 355, VTS-05 /-05-C

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**Foundations plan**

![Foundations plan diagram]
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