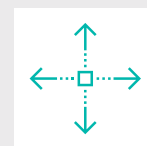
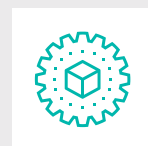
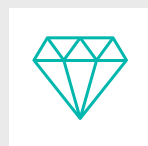
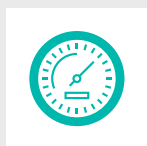
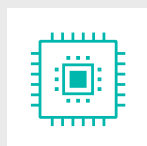


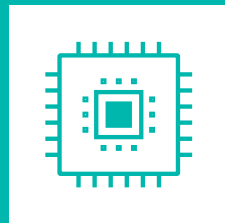
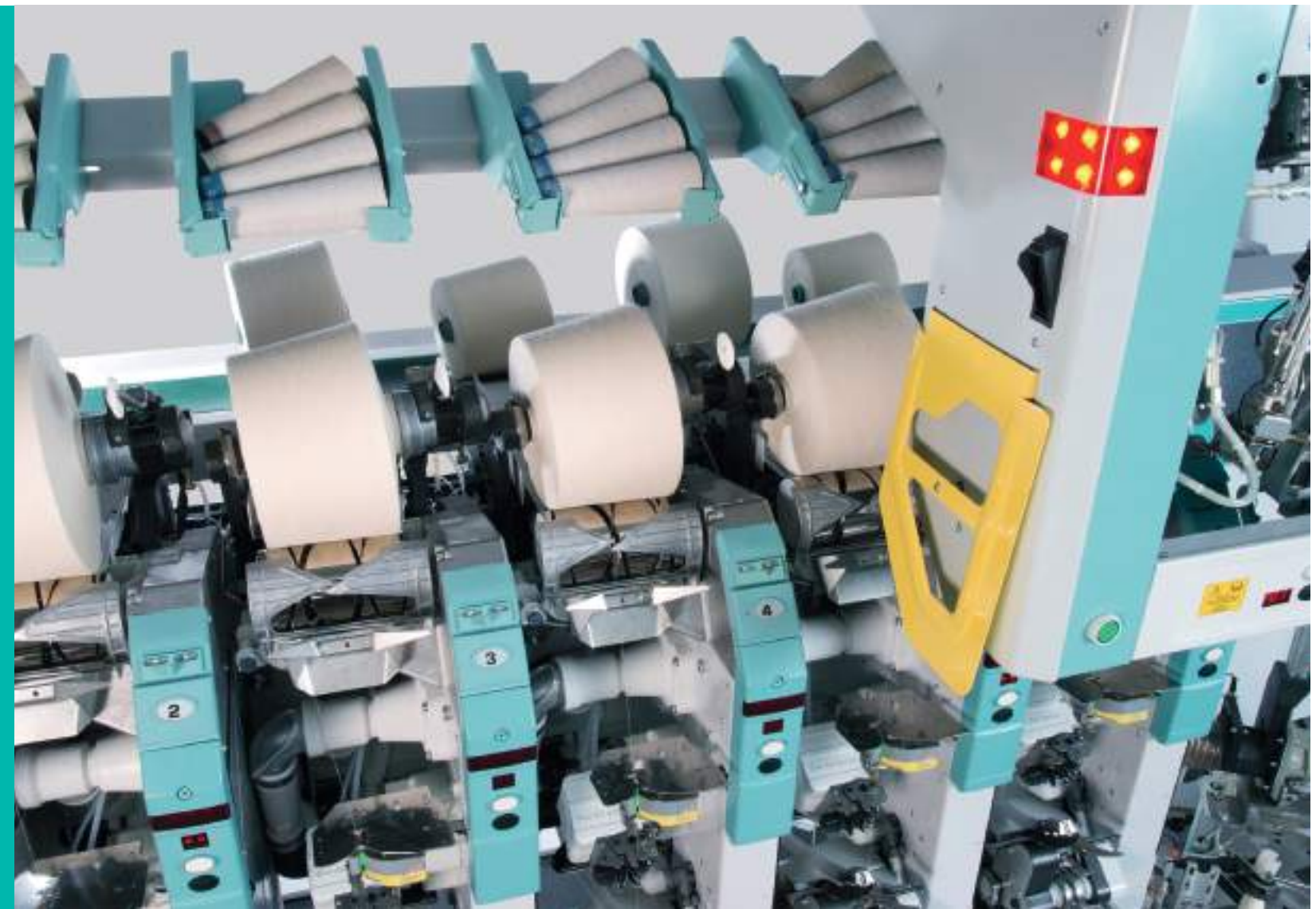


AUTOMATIC WINDER

Polar Evolution

AUTOMATIC BOBBIN FEEDING TYPE

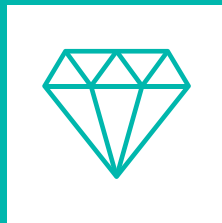




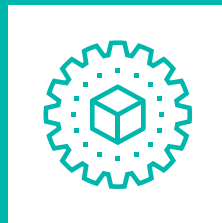
TECHNOLOGY



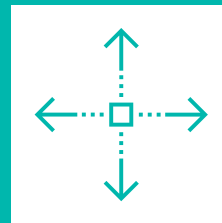
EFFICIENCY



QUALITY
OUTPUT



AUTOMATED
SOLUTION



FLEXIBILITY

AUTOMATIC WINDER

Polar Evolution

ROUND MAGAZINE TYPE

Savio's well proven and the bestselling automatic winder, still the #1 winder in many world markets. Extremely popular all over the countries, Polar model has been recently developed to the **Evolution** series, gathering all the innovative solutions in terms of technology, efficiency, quality output and maintenance.

MACHINE MODELS:
POLAR EVOLUTION E

automatic bobbin feeding and doffing (Stand-alone system)

POLAR EVOLUTION E PREMIUM

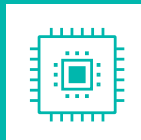
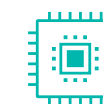
automatic bobbin feeding and doffing (Stand-alone system). Freestanding winder provided with new features to process bobbins produced by ring frames not equipped with automatic doffing device.

POLAR EVOLUTION I/Direct Link System

automatic bobbin feeding and doffing (Link system)

BENEFITS:

- Greater productivity
- Flexible production planning
- Consistent package quality
- Power and compressed air savings because unnecessary splicing cycle are avoided
- Minimum yarn waste
- User friendly
- Proven reliability



TECHNOLOGY

A further step for Polar family to catch the world of IT applications and the new textile synthetic and artificial fibers applications.

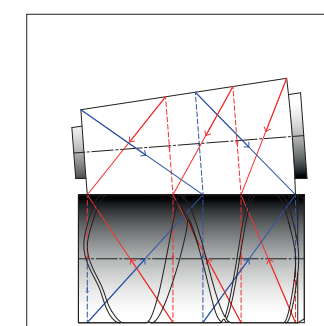


New Evo drums for improving package-unwinding performance

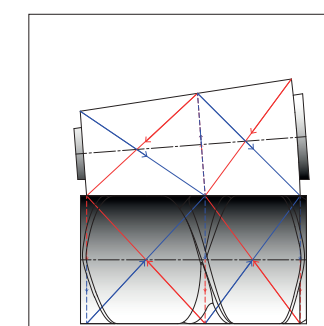


Yarn quality and costs are decisive criteria in the highly competitive textile market. In downstream processing, the unwinding behavior of the package and the take-up speed facilitate process to be more efficient and geared to benefit. The EVO drums offer new capabilities to optimize both the unwinding speed of the packages and the package yarn content, through variable number of turns with different winding angles.

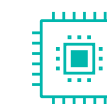
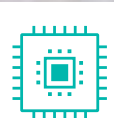
The technological developments of MMF yarns for following fashion trends require constant innovations on the machinery technology too. Savio has now a full range of grooved drums to cover all yarn types, counts and downstream processes. The package shape is optimized in order to obtain advantages for a better unwinding ratio in the downstream process, for homogeneous package density and for lower rewinding breaks.



3/2 EVO
ALL STAPLE FIBERS MEDIUM AND FINE COUNTS
 FEATURES & TEST RESULTS
 Lower rewinding breaks -30%
 Homogeneous package density

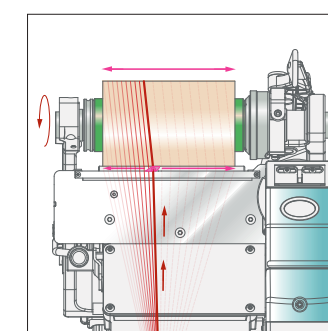


2 EVO
ALL STAPLE FIBERS COARSE MEDIUM COUNTS
 FEATURES & TEST RESULTS:
 Higher package content
 Even Hardness performance
 Wider winding angle to fit better coarse yarns

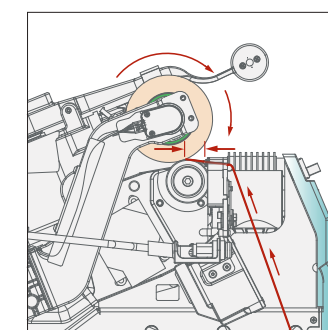


Multicone: the digital yarn layering technology

The different downstream processes require a wide flexibility in the wound package building, in order to optimize the specific efficiency. Packages for dyeing, warping, weft, knitting, double twisting, require a different and flexible package formation in terms of geometry, edges shape and density. "Multicone" system, the digital yarn layering technology (drumless) represents today the proper solution to achieve this kind of flexibility in the package formation.



Straight path layering system
The only one that allows a precise and controlled yarn deposit on the format, being the thread guide movement much closer to the package than any other "pendulum" system, keeping also a fixed distance delivery point. This guarantee a precise control of the thread during the whole traverse stroke and mainly of the package edges area, where the yarn dynamics is critical, because of the stroke inversion effect. Savio's thread guide system can easily prevent any possible yarn fall and package bad shape, which more frequently occur in the "pendulum" system.



Much closer to the package than any other pendulum system

Tension control The C.A.T. (Computer Aided Tension) and Tensorflex directly interact with the Multicone digital system in order to even the winding tension during the whole process, with any yarn count and material type (including single /double core,

siro spun, etc).
Density In case of very fine single cotton yarn or finest wool for dyeing purposes, the machine can be equipped with the optional C.A.D. (Computer Aided Density).

THE WINDING MODE AND PACKAGE SHAPES

Step-Precision winding Step variation of the winding angle at different diameters to control the distance between yarn layers through all the package building, assuring a consistent density and avoiding any possible ribboning effect. A precision winding mode can also be selected. We recommend using this mode in case of small package diameter in order to keep the full consistency of the building.

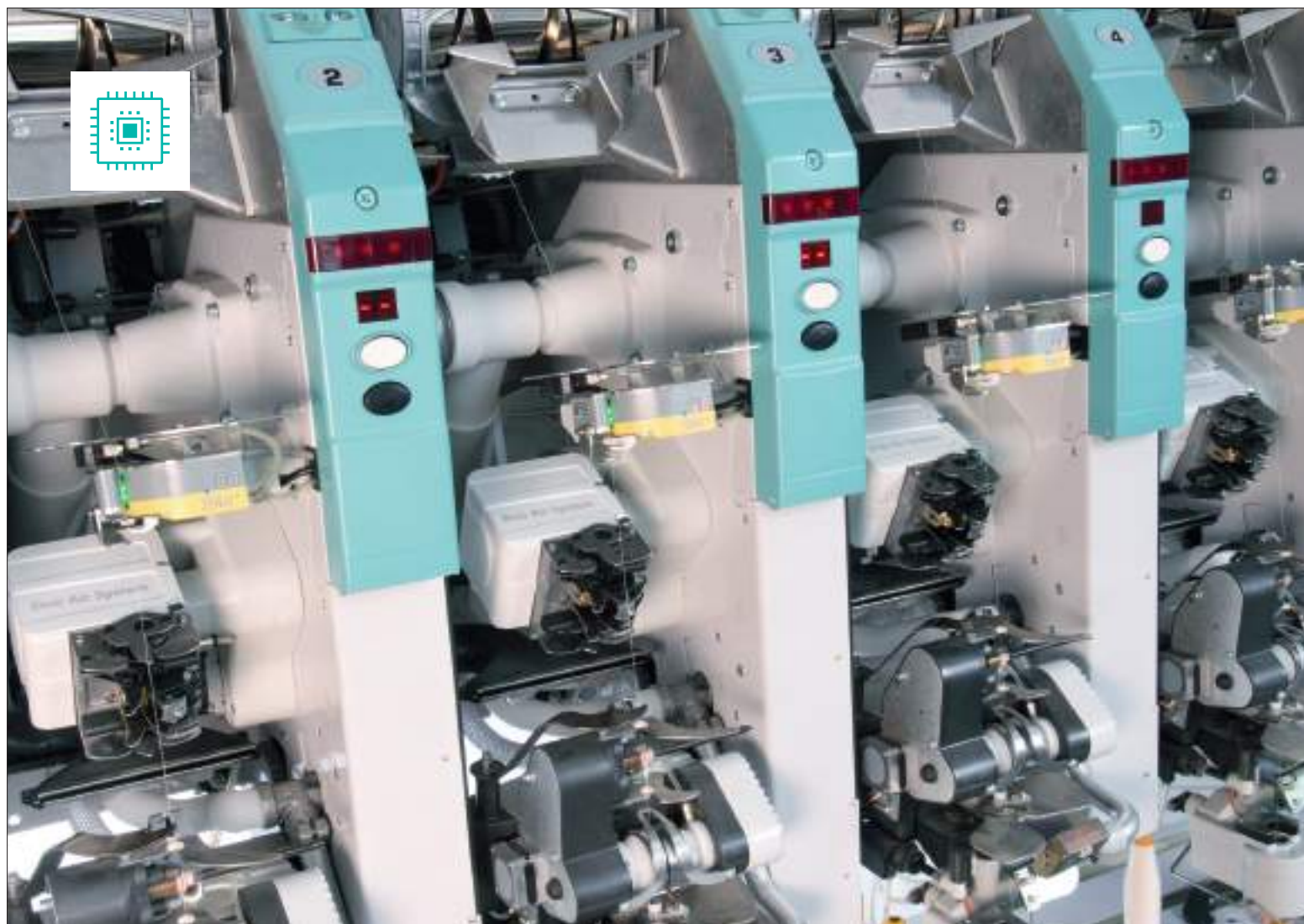
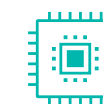
Traverse stroke Infinite variation deposit modes permit the building of the package with any individual geometrical design (tapered- cylindrical-round edges-

pineapple). Relatively to the take-up tube, symmetrical, left/right wise asymmetrical building.

Package edges Soft edges values ensured by different stroke length. Several edges shapes (taper or round) ensured by linear or curvilinear reduction stroke ratio.

Controlling the winding process

The simplified PC interface allows to easily program with few settings the working parameters and can be easily selected by any mill operator; this flexibility allows reducing setup times. The thread guide electronic control allows to set winding angle, traverse stroke, position on the package tube and the yarn distribution over the package. All above improves design and formation of the package, optimizing all the downstream processes, thus allowing customers to obtain the best results.



Upgraded splicing solutions - Duo Air Feeding system

Air and Moistair® splicers boasts a **Duo Air Feeding system**, for yarn tail preparation and splicing. This splitting allows the individual setting of the most appropriate value of air pressure, and makes these splicers able to easily process any different fibers and blends combination.



Air splicer

Settings are completely centralized in the PC:

- Fast and simple change
- Consistent uniformity of splice in each different spindle

Main application range:

- Cotton 100% and blends
- Cotton Compact yarns
- Fancy yarns
- Core yarns
- Synthetic and artificial yarns
- Wool 100% and blends
- Silk

Moistair® splicer (optional)

Moistair® is an innovative air splicer using a very small quantity of water (spray). It is endowed with a water valve with dosage setting to moisturize the splice. Suitable for almost all kind of short and long spun yarns. The Moistair® has delivered superior performances on TENCEL® and fine counts.

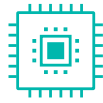
Settings are completely centralized in the PC:

- Fast and simple change
- Consistent uniformity of splice in each different spindle

Main application range:

- Short and long spun yarns
- TENCEL®
- Elastic core yarns (single core, dual core)
- Very fine cotton yarns
- Coarse and slub yarns





Splicer library

Settings of air and water parameters are individually adjusted per each winding head.

Water splicer (optional)

The splicing operation is made under vacuum while the water is injected (Duo-Stage). All the splicer parts are located in a "water proof" housing to avoid dangerous spray of water outside.

Main application range:

- Cotton 100% coarse counts (flat and fancy yarns)
- Cotton 100% compact yarns
- Mercerized/singed yarns
- Elastomeric yarns
- Two ply yarns
- Open End yarns
- Synthetic yarns
- Linen yarns



Heat-Splicer (optional)

The consolidated experience on the splicer air technology in combination with the use of the heat, guarantees a final joint with excellent appearance, high and consistent strength even with, difficult yarn structures, different blended materials and high twisted yarns.

Main application range:

- Carded wool coarse counts
- Mule spun yarn
- High twist yarns
- Wool 100% and blends



Twinsplicer (optional)

The way the splice is prepared and made, ranks the Twinsplicer at the top among all other splicing devices. The splicer strength is always above 95% keeping the appearance same as the parent yarn. The splicer on compact yarns, beside the strength, needs an extremely good appearance not to create a visible defect on the finest fabrics. The Twinsplicer for core yarns preserves the elastomeric filament entirely inside the joints.

Main application range:

- Cotton 100%
- Cotton 100% Effect yarns
- Compact Yarns
- Elastomeric yarns
- Cotton and blends

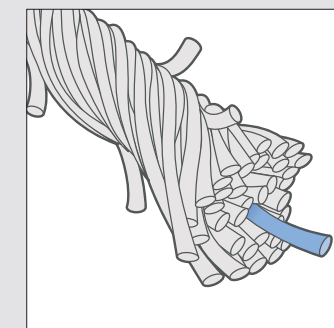


Core yarns

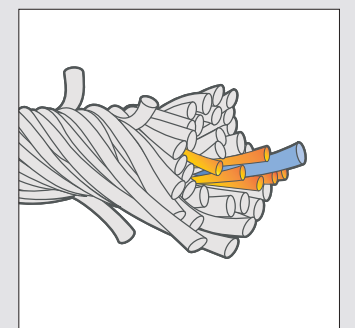


The demand for yarns with elastomeric core is expanding, and plays an important role because of fashion versatility and flexibility. Stretch garments are playing an important role inside this scenario, denim jeans and leggings are highly requested, especially for womenswear. Keeping up this trend of stretch denim, many yarn & fabric manufacturers are offering duo core yarns with improved recovery and strength, while retaining the comfort of cotton next to the skin. Dual core spun yarns are consisting of three components: a core filament - mainly Lycra®, a polyester multifilament as T-400® and a staple fiber- mainly cotton. This special yarn offers improved recovery and strength compared to traditional core spun technology.

Savio Polar Evolution can easily process special and challenging yarns. Savio winding unit is equipped with splicing and tension control devices for ensuring perfect joints and perfect package shape. A common problem faced by the stretch fabric manufacturers is the breakage of the yarns during downstream process. The well-known Savio Twinsplicer still represents the solution to achieve the best performance of a "perfect joint" on Core Yarns, mainly "single core" with cotton, but also positive results have been achieved with Dual Core Yarns. In this field, Savio can also offer the new splicing technology combining air and water, Moistair®, which represents the most flexible solution of any kind of yarn.



Core spun yarn is created by twisting staple fibers around a central elastomeric filament core, usually made of LYCRA® fiber. Different basic fibers (short and long staple) are commonly used: cotton, viscose, siro, woolen blends.



Dual core spun yarns are made of three components: a core filament - mainly LYCRA®, a polyester multifilament as T-400® and a cotton fiber. This special yarn offers improved recovery and strength compared to traditional core spun technology.

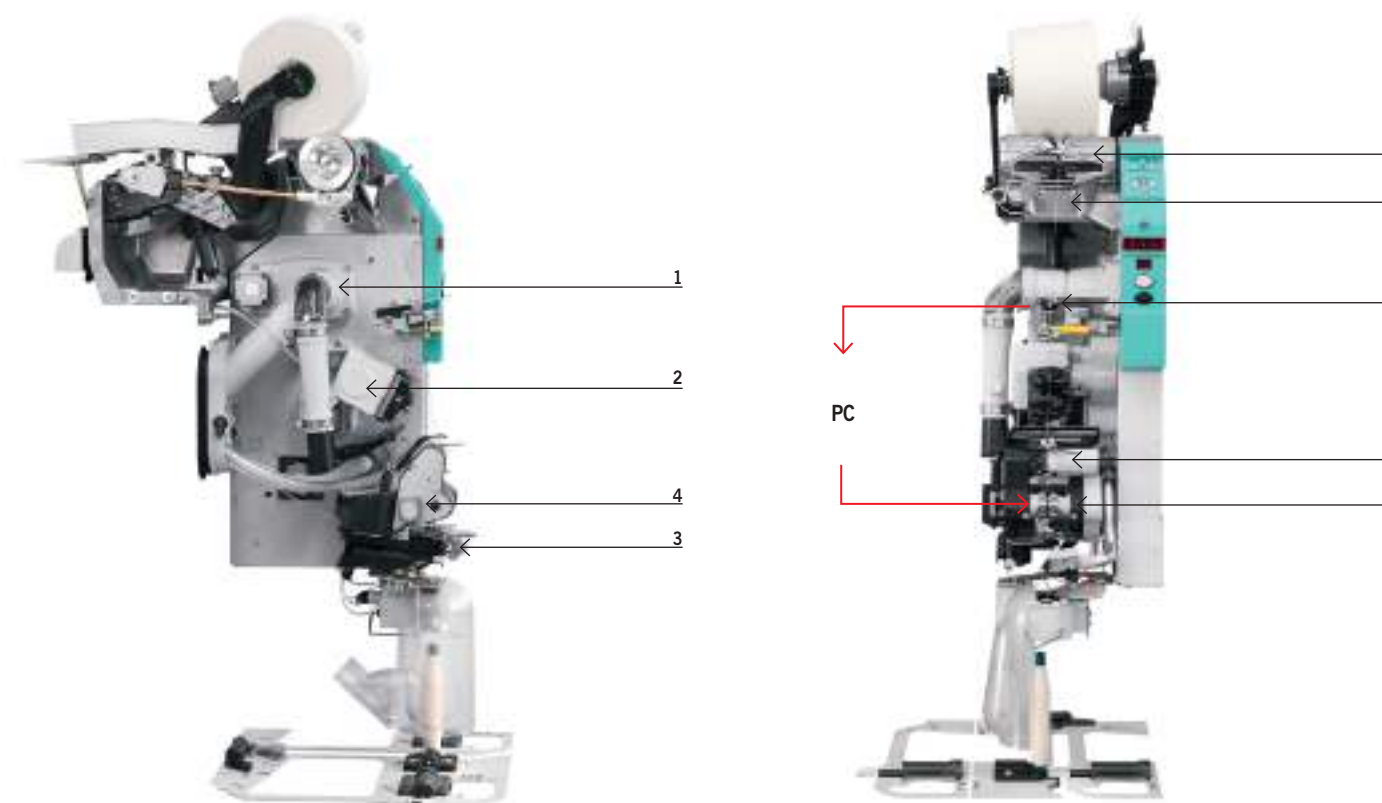


EFFICIENCY

Polar Evolution is equipped with devices aiming to increase the winding spindle efficiency, through a continuous control of the yarn quality and production output in presence of any yarn type including high added value and innovative yarns.



Flexible cycle for increased efficiency



The package and the bobbin suction arms along with the splicer are individually driven by independent motors in order to reduce the splicer cycle time. Splice occurs only when both arms bring the yarns into position. Consequently:

- Greater productivity
- Consistent package quality
- Power and compressed air savings because unnecessary splicing cycle are avoided
- Minimum wear of the parts
- Minimum yarn waste

Independent motors also drive yarn tensioner, waxing device (optional), drum and cradle.

- 1 Independent movement of the package yarn suction nozzle
- 2 Independent movement of the splicer
- 3 Independent movement of the bobbin yarn suction nozzle
- 4 Independent movement of the yarn tensioner device

C.A.T.

Computer Aided Tension

The winding tension is detected continuously by the Tensor, which interacts with the yarn tensioner device, through the machine PC, in order to adjust the load on the yarn as required. The Tensor, being positioned just before the drum detects on line the real winding tension. The sensor does not have any movable parts and performs as "antiwrap system".

Tensorflex (standard)

In presence of elastomeric yarn blended with wool/cotton the tension values must be diversified during the package formation to ensure a perfect shape.

- 1 Drum
- 2 Traverse
- 3 Tension sensor TENSOR
- 4 Waxing device
- 5 yarn tensioner



Simplified PC monitoring



The simplified PC interface allows an easily programming with few settings the working parameters and can be easily selected by mill operators, reducing set up time. Furthermore, all the clearers of the last generation are totally integrated with the Polar Evolution process logic. The main PC display for winder and electronic clearers setting & control are totally integrated.



Spindle Monitoring System

Each winding head is equipped with an alarm monitoring system. The operator is notified in real time of the ongoing alarm. Each spindle indicates technological as well as functional alarm.

Clearing logic

All the clearers of the last generation are totally integrated with the Polar Evolution process logic. Each single spindle becomes a technological laboratory to ensure the production of a faultless package. In addition to the control of the main single or repetitive yarn defects, splice included, the system foresees the possibility to remove from the package all technological defects communicated by the clearer. The spindle provides automatically to remove from the package the faulty portion of the yarn. The clearer PC is totally integrated.



Energy Saving



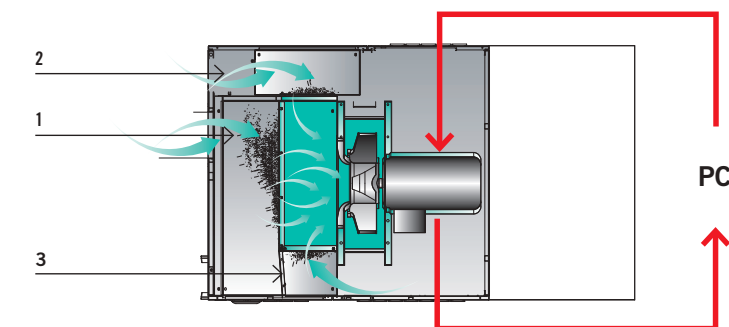
Particular attention has been given to the suction system, which represents the highest portion of the energy in the winding process. The motor fan adjusts its speed automatically in accordance with the actual working conditions and parameters. The yarn waste is collected in a separate filter box located in the machine headstock. The same fan provides also the

vacuum to unload the travelling blower waste, once the blower reaches the proper discharge pipe also located in the headstock. The travelling blower waste is collected in a second separate filter box. In case of the "Dust collection system" device, the waste is unloaded in a third separated filter box.

Dust collection system

A single suction unit for each head, located at the height of the balloon breaker, captures fibrils and dust produced when the bobbin is being unwound. A fan, that serves two sections of heads, creates suction. A filter collects the impurities and dust.

- 1 Yarn waste filter box
- 2 Dust removal system filter box
- 3 Travelling blower filter box



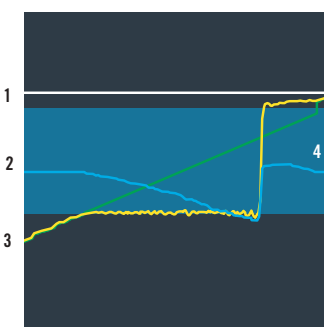
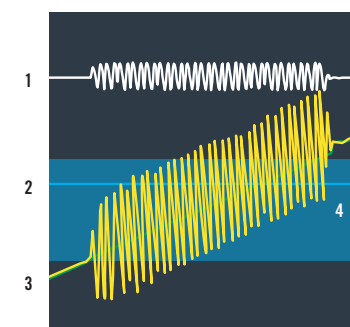


QUALITY OUTPUT

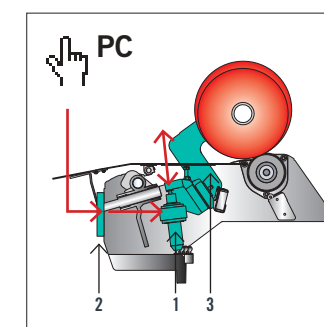
The Savio winding unit is equipped with control devices for ensuring perfect density, metering and perfect package shape. These unique devices contribute to produce packages without ribbon and ensure the minimum possibility of breakage, slough-off during unwinding at a very high speed, particularly in fine count, results into higher efficiency in Weaving & Warping department.



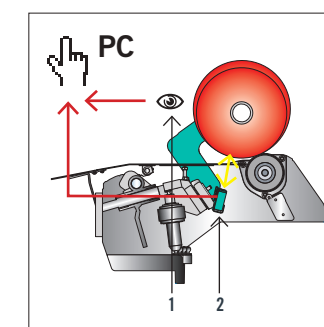
Premium package quality



- 1 Drum speed
- 2 Package holder position
- 3 Ratio between package/drum diameter drive in actual time
- 4 Ribboning zone



- 1 Piston
- 2 Electronic/pneumatic valve
- 3 Cradle



- 1 Package and drum speed sensor
- 2 Laser detector signal

Electronic anti patterning system

On/Off modulation operates at critical diameters only. In the On/Off system, all the critical rates between package and drum diameters are memorized by the computer and consequently the drum is accelerated and decelerated, according to variable ramps, when there are possibility of ribboning formation. The system operates also during the acceleration after the splicing cycle.

C.A.P - Computer Aided Package® (Optional)

It gives a perfect package, without ribboning and without changing the drum's speed. The computer checks the distance between two consecutive layers, and modifies the ratio between package and drum diameters by micrometric variation of the inclination of the package cradle, and consequently of the driving point.

C.A.D. - Computer Aided Density (Optional)

- Control of the package load on the drum.
- The package weight increase is detected by the length metering; consequently, the "electronic/pneumatic valve" is activated.
- Customized package load curve.
- The relevant parameters are programmable and stored in the machine PC.

The system is especially studied to process compact yarn producing soft packages for Dyeing (0.32 / 0.35 g/cm³).

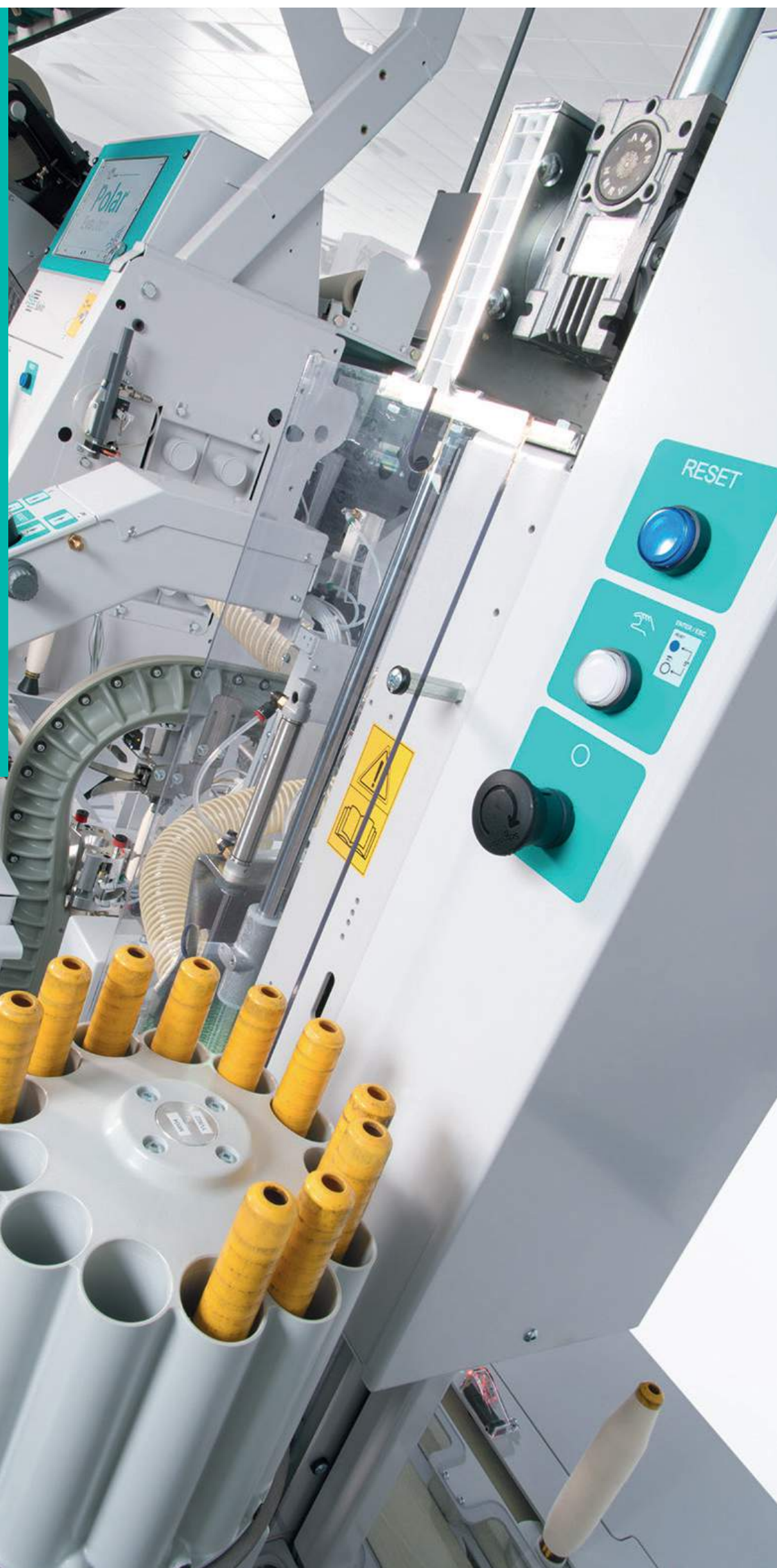
C.A.M. - Computer Aided Metering (Optional)

- The combination of the laser detector beam with the package and drum speed sensor, is elaborated by the machine PC software.
- The system allows a metering high precision repetitiveness $\pm 0,5\%$.



AUTOMATED SOLUTIONS

Savio has responded to the increasing requirements of automation by implementing fully automatic winding machines. Savio offers a wide range of winders with different levels of automated devices to overcome the shortage of labor, cut running costs and enhance the quality of the yarn product.



Link system - Polar Evolution I/DLS

The **Savio Direct Link System (I/DLS)** solution, for linking the ring spinning frames (RSF) to the winders, enables a fast and efficient direct feeding of bobbins, along with the full interfacing flexibility with all kind of RSF (single or multistep).

The Savio Direct Link System (I/DLS) solution, for linking the ring spinning frames (RSF) to the winders, enables a fast and efficient direct feeding of bobbins, along with the full interfacing flexibility with all kind of RSF (single or multistep). The Polar Evo/I DLS boasts an unique spinning frame to winder close loop feeding system, the winder being an extension of the same, ensuring total free flow if the materials. From RSF bobbin to the final package, the yarn is processed untouched, ensuring maximum quality, less material handling and no chances of contamination. The incoming bobbins are guided to the yarn end finder station to be prepared for the following winding process, and then delivered to the winding heads. Each winding head has two spare bobbins in addition to the one under process, with straight vertical yarn path. Upon request, machine can be also equipped with additional single automatic magazine for refilling empty ring frame tube (optional).

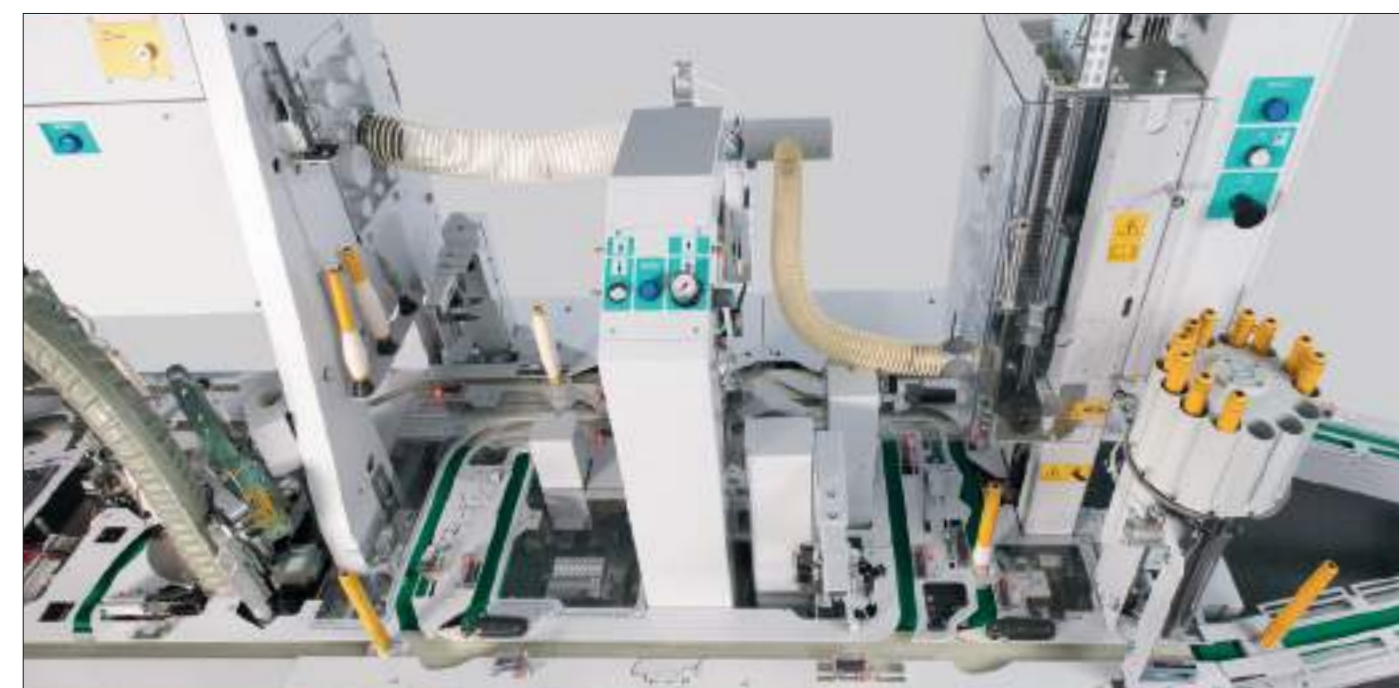
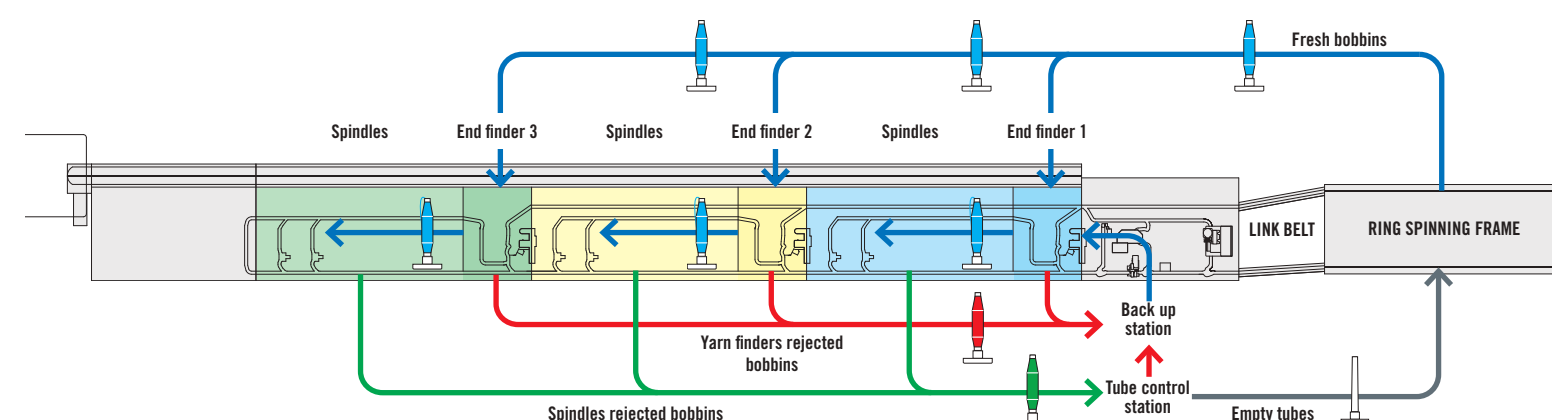
Intelligent bobbin distribution

Intelligent bobbins distribution: balanced feeding of all spindles

- Independent single End Finder Station feeds the allotted winding section.
- Up to N°3 End Finder Stations to serve longer machines.

This layout solution allows:

- The highest balanced flow rate of fresh bobbins for allotted sections (no idle spindles).
- Total reduction of bobbins traffic jam.
- Automatic removal of technological alarms and rejected bobbins, thanks to the "Backup Station" (optional).
- Minimization of the operator intervention.





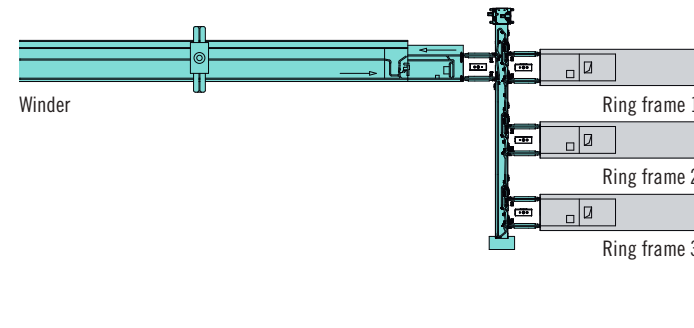
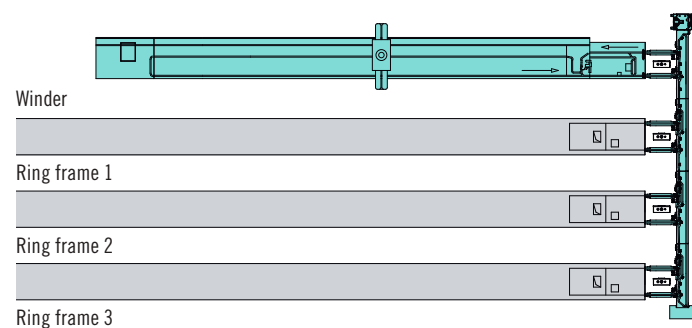
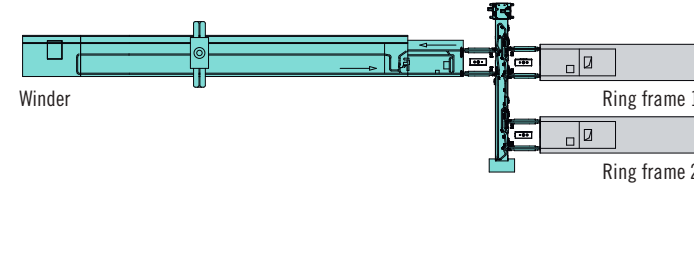
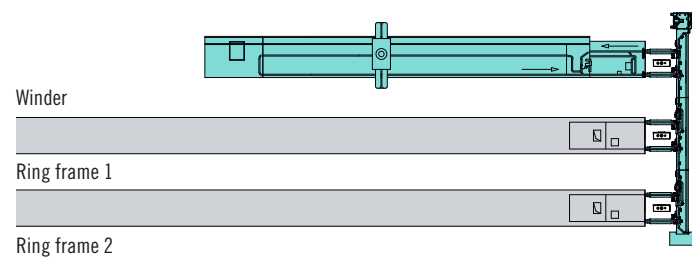
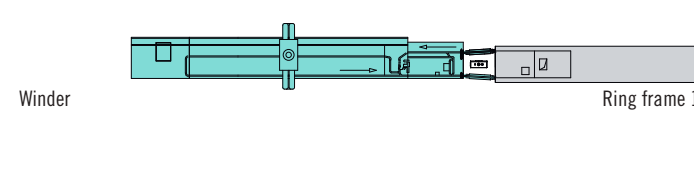
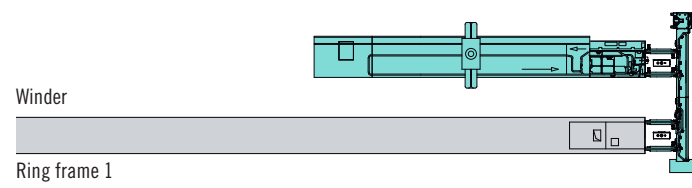
Multi Link Solution

Multi Link - Classic or Underground Solutions

The requirement for integrated automation in the spinning process is increasing, leading Savio to offer customers new bespoke link solutions, compared to the classic 1-to-1 configuration, to increase this direct feeding flexibility to/from winder. Each winder can so be predisposed to process 2 or 3 different yarn counts. The latest solution from Savio is the **Multi Link**, which connects multiple ring spinning frames to one Savio winder, becoming a tailor-made circuit to link two or three RSFs to one winding machine. A special iPeg tray guarantees the circulation of RSF bobbin to/from winder. This solution optimizes space, reduces energy-consumption and production costs. This automatic bobbin transport shortens servicing paths for the operators and allows an ergonomic material flow. The costs for production, space and energy are reduced, while keeping the quality consistent even with long and multi-connected machines.

iPeg

A special iPeg, with embedded tag, guarantees the circulation of RSF bobbin to/from winder. Each winder can be predisposed to process 2 or 3 different yarn counts. Tag readers automatically select the proper bobbins to be delivered to the correct winder section and to be returned to the proper RSF. The spindle tag reader prevents to process wrong yarn count in the wrong section, so avoiding a potential bobbin pollution.



Parallel Configuration

In-Line Configuration



End Finder Station of Polar Evo I/DLS

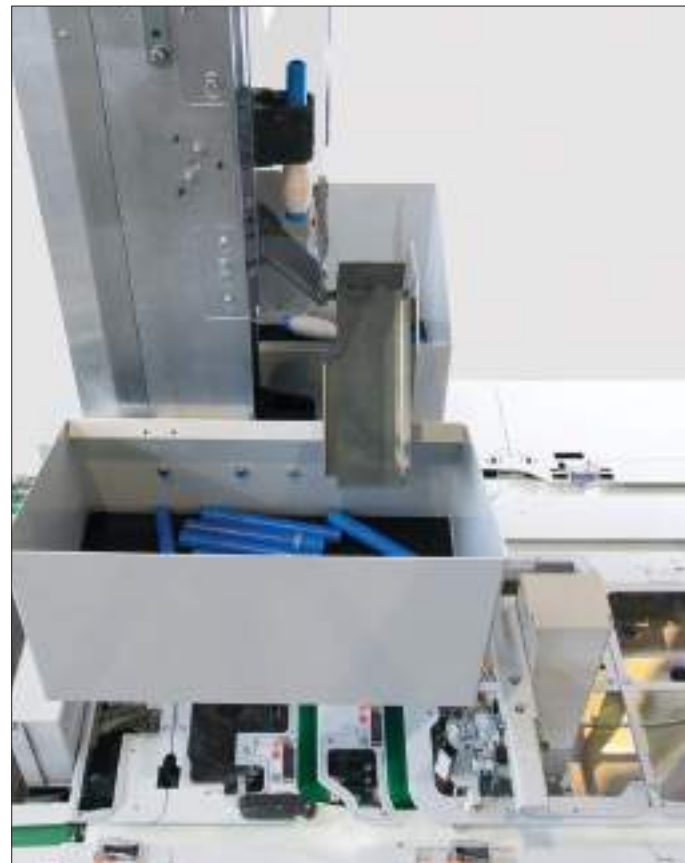
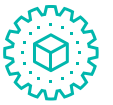
Yarn bobbins coming from the ring frame are automatically delivered to the end finder stations located along the machine. Each end finder station is positioned along the spindle housing, allowing a complete operator monitoring and friendly intervention. The machine can be equipped with different numbers of end finder stations depending on capacity of longer ring frames. Their position being placed separately from the main bobbin/pegs belts path, do not affect at all the efficiency of the system. Customized end finder stations are available in compliance with particular yarns and material under process especially with elastomeric yarns. Particularly, because of core and double core yarn construction technology, it is required a customized "lycra kit" configuration to reach the same efficiency as per standard yarns, no matter the elasticity of the threads. With "lycra kit" configuration, the end finder becomes "universal" for both standard yarns and core yarns bobbins.

Backup Station (Optional)

A great help to ensure the highest efficiency of the winding process is given by the "Backup Station" which shall take care of all bobbins rejected by the spindles for different reasons:

- Bad shaped bobbins
- Bobbin with yarn remnants
- Bobbins with technological alarms (off-standard quality yarn values)

The station is able to prepare again the bobbin, with a high efficiency rate, because of the slow moving speed, and to remove the faulty yarn portion, in case of a technological alarm. The diversified and specific movements are possible thanks to the "identification system" embedded on the spindle and peg tray. The result is also significant in terms of operator reduction, since no intervention is requested to the personnel.



Bobbin stripper (optional)

The winder can be equipped with an automatic tube-cleaning device that removes any type of residual yarn. No setting is required, and thanks to the extrusion operating system, the tubes are prevented from any damage even in case of toughest yarns.

OBS - Off Standard Bobbin Selector (optional)

In alternative to the bobbin stripper, the OBS Station removes bobbins with residual yarns. In presence of iPeg, the OBS removes bobbins with technological alarms.

S.I.S. - Savio Identification System (optional)

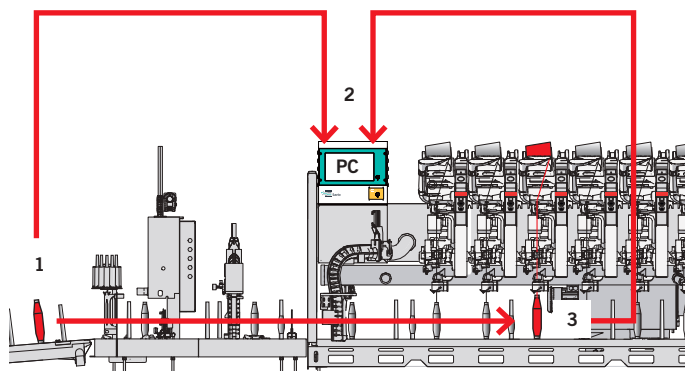
Since 1999, the market most successful identification system of the RSF spindle and control of bobbin quality

The development of special yarns requires an adequate and accurate monitoring of bobbin quality during the winding phase, and the identification of the position of the "faulty spindle" in the ring frame. Each bobbin delivered by the ring frame is tagged and recorded in the PC. The winding head reads the code of the bobbin iPeg on process and identifies the position of the spinning spindle, which has generated it. The S.I.S. system beside the identification of the ring spinning frame spindle, gives also the possibility of handling the flow of the rejected "off standard bobbins" with the following different options:

- Bobbins delivered to a dedicated technological parking area.
- Bobbins delivered to a selected winding head, and wound on **B-Grade packages**.
- Bobbins delivered to Back Up station (if present) for defects removal, and returned to winding head.
- Bobbins delivered to OBS station to be unloaded in a separate box.

Package B-Grade System - Manual (optional)

Machine can be provided from one up to three "B-Grade" spindles to process off-standard bobbins rejected by winding heads or Backup Station.



- 1 Bobbin numeration and peg code reading
- 2 Coupling of spindle/peg code
- 3 Peg code reading

Free standing system - Polar Evolution E

Ring spinning frame bobbins are loaded into the hopper box and then placed on the Flexitray (peg) to be transferred to the preparation station. Each bobbin placed on Flexitray is automatically moved to the yarn "end finder station", in order to prepare it for the following winding process.

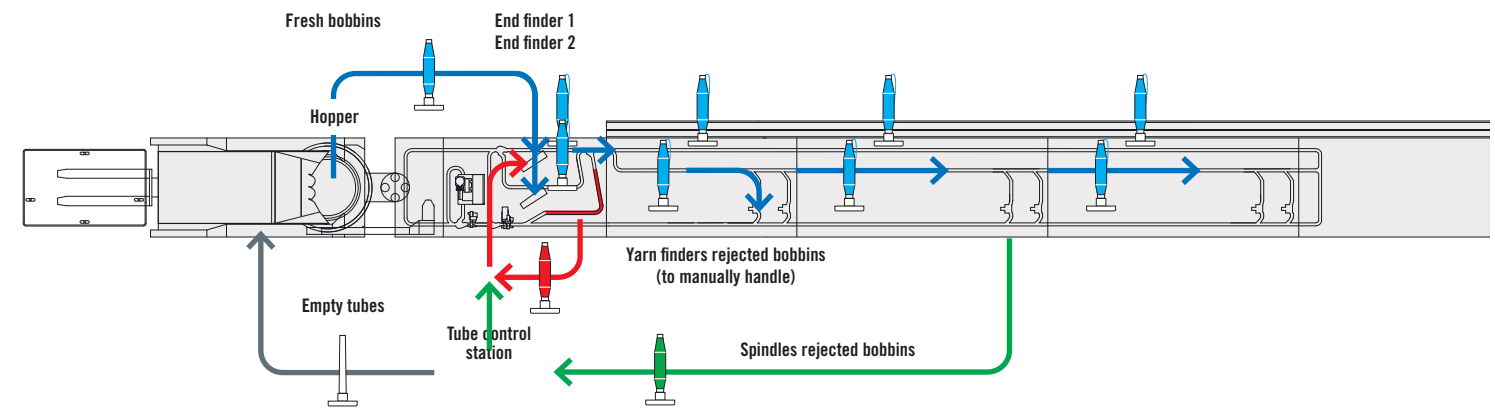
Automatic bobbin loader

Ring spinning bobbins are unloaded into a hopper, with a capacity of 3000 cycles/hr. A self-adjusting vibration frequency device ensures the consistent delivery. A collector guarantees a safe and even flow of the bobbins movement. Bobbins are then placed on the Flexitray to be transferred to the preparation station. The peculiar Flexitray design allows:

- Precise centring of the bobbin on the peg and perfect positioning with the yarn path.
- Flexibility to process different bobbin tube sizes and dimensions.

Bobbin preparation station (side suction system)

Simple, efficient and reliable even with the most difficult yarns and bad shaped bobbins. An additional "under winding cleaning" device removes the yarn reserve, left over on the bobbin tube.





Free standing system - Polar Evolution E Premium

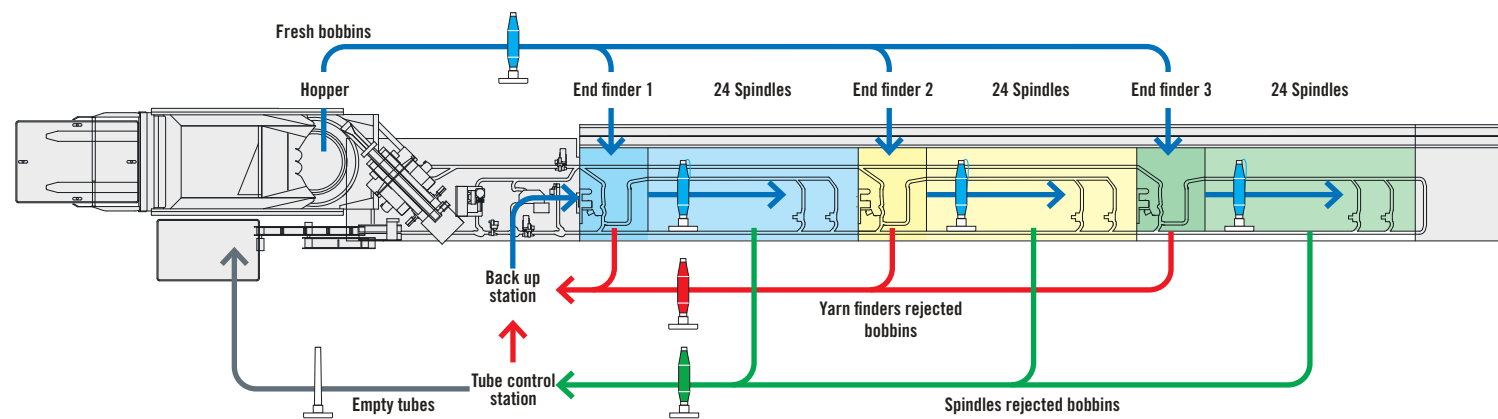
“Premium” freestanding winder is provided with new additional features to process bobbins produced by ring frames not equipped with automatic doffing device.

This winder is an alternative solution for all those mills where mainly existing ring frames are without automatic doffing, it has been designed to evenly process those yarn bobbins, whose formation is not originally “favourable” to reach efficiency, keeping also the minimum number of operators.
The bobbin capacity has been increased thanks to the “double alternate” loading system on the peg; this higher loading rate is able to cover winding heads up to 72 spindles.

Hopper
The capacity has been increased thanks to the “double alternate” bobbin loading system. To achieve the full efficient peg loading rate, bobbins are mechanically spaced, bobbin shape identified by the “optical profile scanner” and properly oriented by the “cross shaped” rotating device. The “optical profile scanner” detects also the empty tube and diverts it into a separate dedicated collecting box. The enhanced hopper capacity and efficiency, allows a feeding rate to cover the demand for longest winder.

Peg Feeding System
An efficient loading system requires that:

- the oriented bobbins before be loaded on the relevant peg, are cleaned from any flying attached yarn by an air suction located in each of the two coupling sleeves.

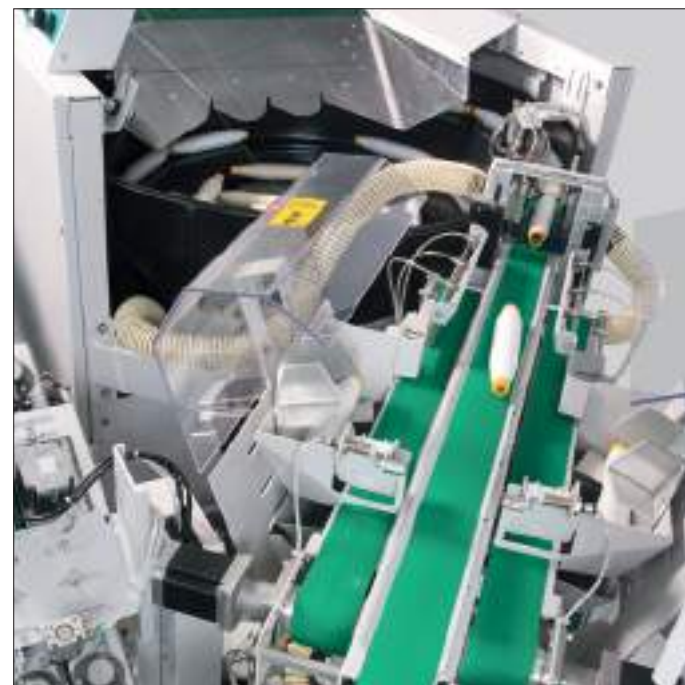


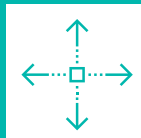
Axial type End Finder Station
The end finder device for “Polar Evo E Premium” has been carefully engineered to easily handle also those bobbins with bad shape and construction, unfriendly for the automation. A movable ring generates air blow to disentangle the trapped end. A bunch remover cleans any yarns reserve at the bottom of the tube. Each end finder station is located along the spindles housing, allowing a complete operator monitoring, friendly intervention and a complete a balanced distribution of the feeding capability. The machine can be equipped up to n° 4 end finder stations to serve machine up to n° 72 spindles.

End finder for elastomeric yarns (Optional)
The end finder device for “Polar Evo E Premium” is also available with an additional “lycra kit”, to grant the highest efficiency for the bobbin preparation, in presence of elastomeric single or dual core yarns.

Back up station (Optional)
The Backup Station takes care of all bobbins rejected by the winding heads for technological alarms, bad shape and yarn remnants. This station is able to prepare again the bobbin with high efficiency rate, and to remove the faulty yarn portion in case of technological alarm.

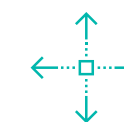
OBS - Off Standard Bobbin Selector (optional)
In alternative to the bobbin stripper, the Off Standard Bobbin Station removes bobbins with residual yarns. In presence of iPeg, the OBS removes bobbins with technological alarms.





FLEXIBILITY

The flexibility to process on same machine contemporaneously different yarn lots and types has to be kept also in the automation process, in order to grant the customer this capability.



Duo-Lot system (optional)

POLAR EVOLUTION E

Each Flexitray carries an identification chip to control the feeding of the right bobbin to the right winding position. The electronic division of the spindle heads (i.e. 12+12 or 16+8) can be programmed by the Computer without any mechanical adjustment on the heads.

POLAR EVOLUTION E PREMIUM

- Capability to process two different yarn lots with same tube dimension;
- The availability of the highest number of winding heads per machine (max n° 72 positions);
- The highest feeding capacity of bobbins per each lot;
- The possibility of highest number of "end finder stations" (max n° 4);
- The even balancing of the winding heads allotment per each lot.



Double hoppers (one for each lot)

Loading rate for feeding up to 72 spindles. The "profile reader sensor" detects also the empty tube and diverts it into a separate dedicated collecting box.



Doffing System



Doffing trolley

- The doffer trolley is electronically integrated with the winding heads and the machine PC.
- All the moving parts are driven by individual independent motors so to reduce the doffing cycle time to 13,5 seconds.
- The universal clamp is able to handle a certain different range of empty tubes conicity simultaneously without parts change.
- A new designed basket geometry to store different tubes conicity with no parts change, and to allow the easy tube color recognition when different yarns are processed on same machine.
- The reserve yarn length is adjustable by the machine PC in order to meet any end user request.
- A fast patrolling speed up to 60 mt/min. in order to increase the doffing efficiency.
- The laser technology ensures the precise positioning of the doffer with the winding heads.

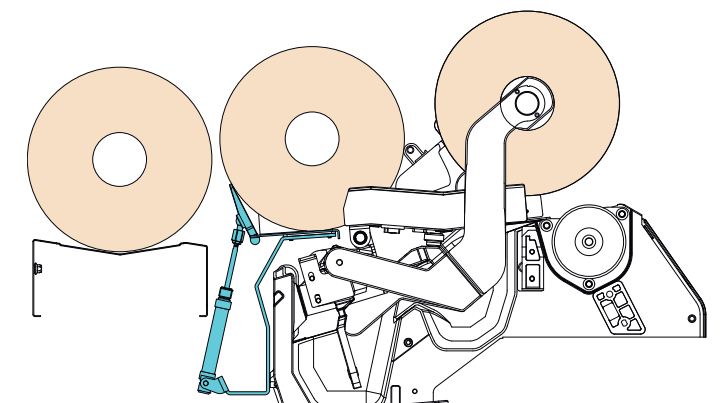
Empty cones centralized magazine (optional)

For the complete automation of the winding process, the machine can be equipped with a centralized magazine carrying all the empty tubes: the operator patrolling and intervention time is reduced. The empty cone is automatically delivered to the doffing trolley.



Flexible package unload

The package is unloaded in a "stand by position" to optimize the winding efficiency, while the spindle will keep on running. Being the unloading area individual and independent per each winding position, customized regrouping of packages can be delivered to the discharge conveyor belt. Unloading mode is managed by PC software, with high level of flexibility.



Smart Industry Solutions for Textile Mills Savio Winder 4.0



Three different levels of winding control monitoring

1. BASIC PACK SAVIO COMPUTER INTERFACE
Connectivity and data downloading

2. BUSINESS PACK WINDER BROWSER
Data management, remote machine set up and monitoring

3. EXECUTIVE PACK WINDER BROWSER + SAVIO SMART BRACELETS
Operators real-time interactivity

Industry 4.0 is the current trend of automation and data exchange in manufacturing technologies. It includes cyber-physical systems, the Internet of things and Cloud computing. Over the Internet of Things, systems communicate and cooperate with each other and with humans in real time. Some aspects that are summarized under the terms "Internet of Things" and "Industry 4.0" are not new for Savio and its textile machinery engineering. Electronics and remote services used for maintenance and process optimization have been applied for many years.

Connectivity, data management, remote machine set up and operator real-time interactivity: this is the Savio way for smart solutions for textile mills. Nowadays, Savio product development is focused on "smart" components that must transmit data online. Once composed solely by mechanical and electrical parts, now winding machines have become complex systems that combine hardware, sensors, data storage, microprocessors, software and connectivity. These smart machineries can increase the efficiency of the spinning mill and perform predictive maintenance avoiding breakdowns and downtimes.

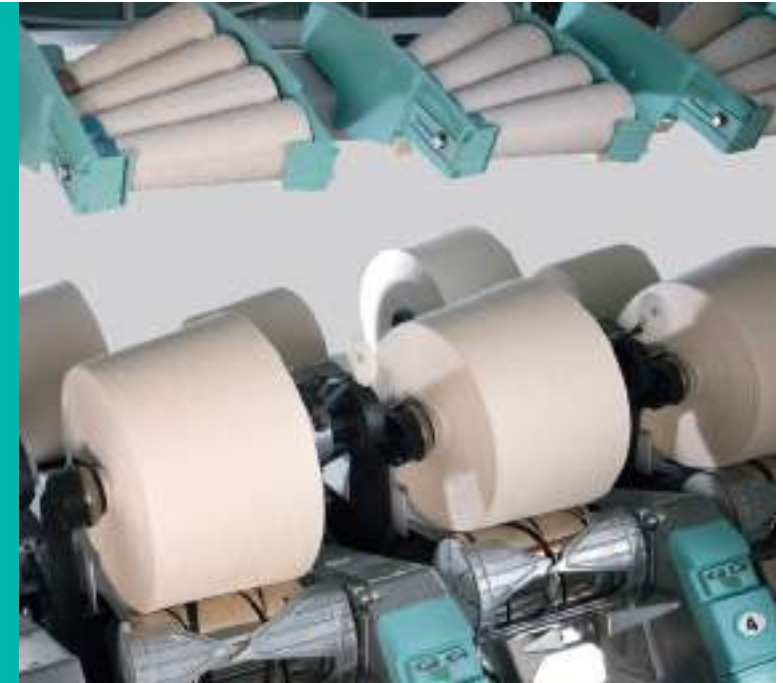
Savio Winder 4.0 represents an important step towards a wide digitalization process, being a solution for intelligent networking of machines in the spinning/winding room. This data management system is a very modern and important management tool, relieving mill management staff of time-consuming routine work. The mill manager can have the winding room live monitoring directly from his/her desk. Thanks to data analytics, a wealth of data are available, allowing to manage the different production phases in the best possible way and to monitor all significant parameters anytime and anywhere, making use of mobile devices.

All these features enable Savio customers to control overall equipment effectiveness, increase workforce efficiency, and maximize quality and working time. Services are even going mobile. Savio Winder 4.0 is also meant as communication between machine operator and service specialist in case of need.



TECHNICAL SUMMARY

Savio has responded to the increasing requirements of automation by implementing fully automatic winding machines. Savio offers a wide range of winders with different levels of automated devices to overcome the shortage of labor, cut running costs and enhance the quality of the yarn product.



	E model	E PREMIUM model	I/DIRECT LINK SYSTEM model
Features	Free standing winder. Automatic bobbin feeding and doffing (Stand-alone system)	Free standing winder. Automatic bobbin feeding and doffing (Stand-alone system). New features to process bobbins produced by ring frames not equipped with automatic doffing device	Automatic bobbin feeding and doffing (Link system)
Feeding formats	Bobbin size: tube length from 180 to 280 mm with a bobbin diameter of 32 to 72 mm. Length 350 mm upon request	Bobbin size: tube length from 180 to 280 mm with a bobbin diameter of 32 to 57 mm	Bobbin size: tube length from 180 to 280 mm with a bobbin diameter of 32 to 57 mm
Materials	Natural, synthetic and blended staple yarns		
Count range	From tex 286 to tex 4, from Ne 2 to Ne 147, from Nm 3.5 to Nm 250		
Headstock	Right or left with respect to the working front		
Frame	Modular frame consisting of 6 or 8 head sections		
Number of heads/machine	From a minimum of 24 to a maximum of 72 in steps of 2	From a minimum of 24 to a maximum of 72 in steps of 2	From a minimum of 10 to a maximum of 72 in steps of 2
Take-up	Crossed packages: winding traverse 110, 152 mm (3/2 EVO drum), 157 mm (2 EVO drum), taper 0°÷5°57', maximum diameter 320 mm		
Take-up speed	400 ÷ 2200 m/min with step less setting		



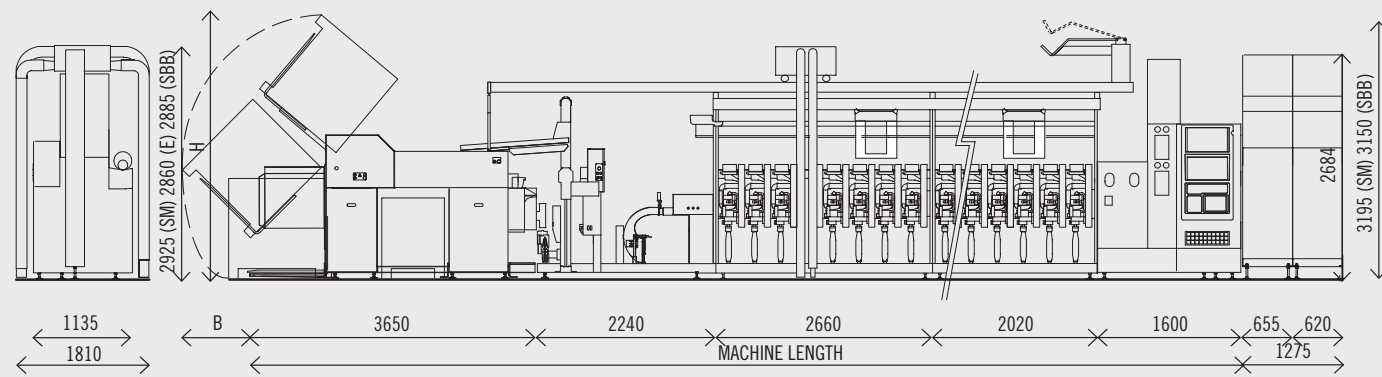
	E model	E PREMIUM model	I/DIRECT LINK SYSTEM model
Winding unit			
Grooved drums	■	■	■
Electronic anti patterning system	■	■	■
C.A.P. Computerized control of the drum-package diameter ratio	□	□	□
Package taper increase: 0° ÷ 5°, mechanical type, electronic only with C.A.P.	□	□	□
Axial displacement: with individual motor	□	□	□
Electronic clearers: Uster, Loepfe basic model with global and continuous yarn and splice control. Other manufacturers on request.	■	■	■
Duo Air Splicer System: Jointair type.	■	■	■
Splicers: Water, Moistair®, Twinsplicer, Heat-Splicer, knotters	□	□	□
Yarn tensioner: a tension section, controlled by a single drive	■	■	■
Pre-clearer: variable width	■	■	■
Tensor - C.A.T. Computer Aided Tension	■	■	■
Waxing unit, deflection type	□	□	□
Wax finished detection probe	□	□	□
Booster: tension reducer	■	■	■
C.A.M. Computer Aided Metering	□	□	□
Counterweight: standard pneumatic device or self-adjusting	□	□	□
C.A.D. Computer Aided Density	□	□	□
Machine body			
Package conveyor belt: single lot towards the headstock	■	■	■
Package conveyor belt: double lot	□	□	□
Lighting along the machine	□	□	□
Travelling blower/suction unit: programmable control frequency and unloading at machine headstock or centralized	■	■	■
Dust removal system in the unwinding area consisting of single suction nozzles with a centralized dust collection box in the headstock	□	□	□
Computer			
Centralised electronic adjustments: machine data, processing parameters, air splicer working parameters (Duo Air types only), yarn tensioner pressure, V.S.S., electronic modulation	■	■	■
Setting, collecting and displaying production data: of winding units, bobbin loading station, doffing trolley, display of the peripheral alarms	■	■	■
Centralized pneumatic adjustments: package cradle counterweight, splicer air pressure	■	■	■

	E model	E PREMIUM model	I/DIRECT LINK SYSTEM model
Data management systems			
Basic Pack Savio Computer Interface: connectivity and data downloading	■	■	■
Business Pack Savio Winder Browser: connectivity, data management, remote machine set up and monitoring	□	□	□
Executive Pack Savio Winder 4.0: connectivity, data management, remote machine set up, monitoring and operators real time interactivity	□	□	□
Bobbin loading station			
End finder station	■	■	■
Additional End finder station	□ up to 1	□ up to 2	□ up to 2
End finder station for elastomeric yarns		□	□
Backup station: to recover bad bobbins		□	□
S.I.S. - Savio Identification System. Peg identification by on-board chip for identification of the RSF spindle and control of bobbin quality			□
OBS - Off Standard Bobbin Selector	□	□	□
Tube cleaner	□	□	□
Bobbin feeding			
Bobbin loading: tipper located along the machine's axis and vibration system to thin out bobbins	■	■	
Bobbin loading: link belt connection, direct bobbin feeding from RSF			■
Bobbin loading: Multi Link connection, a tailor-made circuit to link two or three RSFs to one winding machine.			□
Duo lot bobbin feeding system. Double hopper (one for each lot)	□	□	
Package unloading system			
Doffing trolley: automatic package doffing, insertion of the cone on the spindle head	■	■	■
Double doffing trolley	□	□	□
Cones feeding: individual cradle on each winding unit	■	■	■
Centralized cone magazine	□	□	□
Double centralized magazine	□	□	
Flexible package unload: stand-by unloading position independent for each winding unit	□	□	□

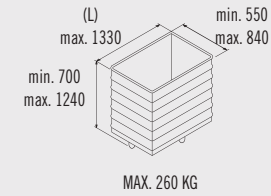
■ Standard □ Optional

Overall dimensions

Polar Evolution E



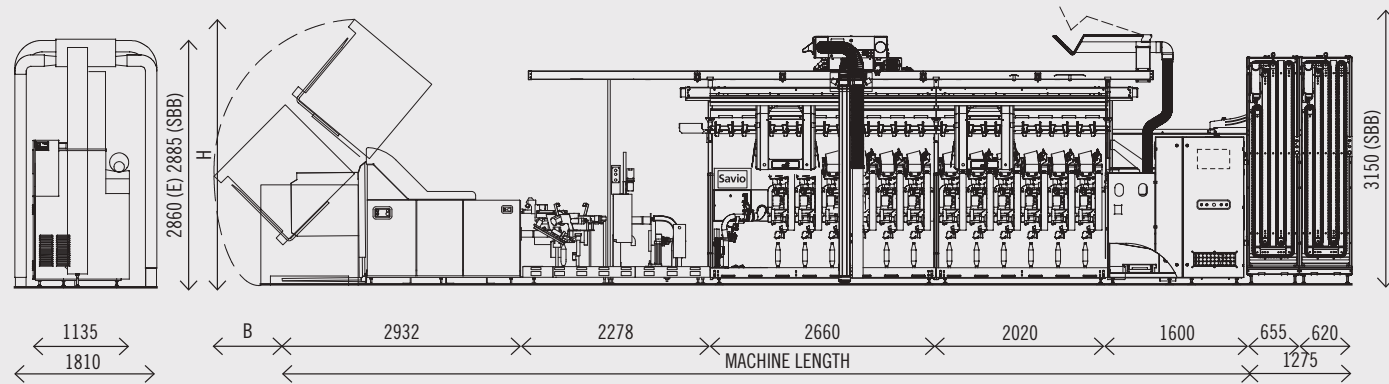
BOBBIN CASE



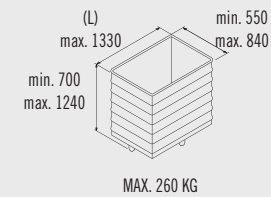
L	B	H
1020	690	3140
1100	740	3200
1200	810	3280
1330	905	3380

N. HEADS	SECTIONS		LENGTH mm
	6T	8T	
24	4	0	15570
26	3	1	16210
28	2	2	16850
30	1	3	17490
32	0	4	18130
34	3	2	18870
36	6	0	19610
38	1	4	20150
40	4	2	20890
42	3	3	21530
44	2	4	22170
46	1	5	22810
48	0	6	23450
50	3	4	24190
52	6	2	24930
54	1	6	25470
56	4	4	26210
58	3	5	26850
60	2	6	27490
62	1	7	28130
64	0	8	28770
72	0	9	31430

Polar Evolution E PREMIUM



BOBBIN CASE



L	B	H
1020	660	2990
1100	720	3060
1200	790	3150
1330	890	3260

WITH 1 END FINDER STATION

N. HEADS	SECTIONS		LENGTH mm
	6T	8T	
24	3	1	15530
26	2	2	16170
28	1	3	16810
30	4	1	17450
32	3	2	18190
34	2	3	18830
34	6	1	18930
36	1	4	19470
38	5	2	20110
38	4	2	20210
40	3	3	20850
42	2	4	21490
44	1	5	22130
46	6	2	22770
48	3	4	23510

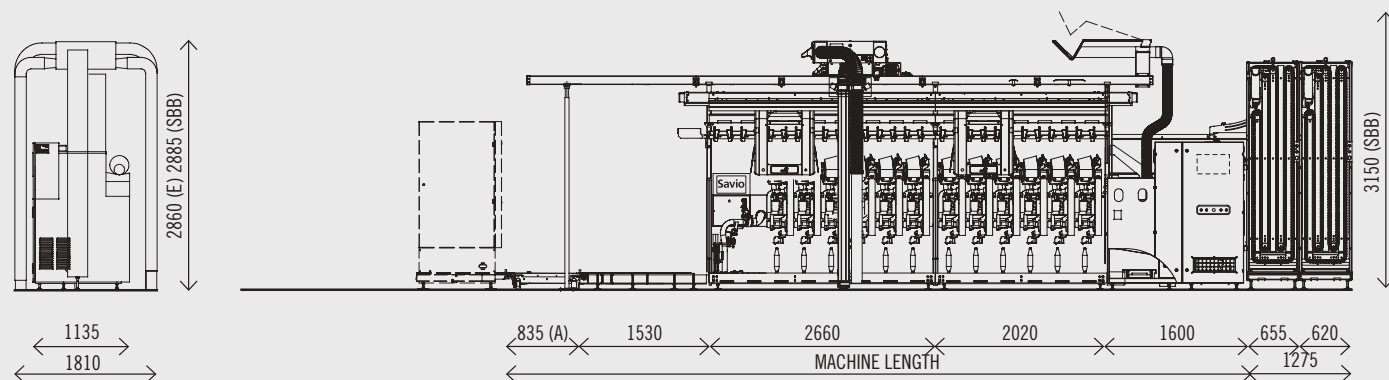
WITH 2 END FINDER STATION

N. HEADS	SECTIONS		LENGTH mm
	6T	8T	
24	2	2	16170
26	1	3	16810
28	4	1	17450
30	3	2	18190
32	2	3	18830
32	6	1	18930
34	5	1	19570
36	4	2	20210
38	3	3	20850
40	2	4	21490
42	1	5	22130
44	6	2	22770
46	3	4	23510
48	2	5	24150
48	6	2	24250
50	5	3	24890
52	4	4	25530
60	8	1	28090
64	6	4	29570
70	3	7	31490
72	2	8	32130

WITH 3 END FINDER STATION

N. HEADS	SECTIONS		LENGTH mm
	6T	8T	
30	6	1	18930
34	4	2	20210
36	3	3	20850
38	2	4	21490
40	1	5	22130
42	6	2	22770
44	3	4	23510
46	2	5	24150
46	6	2	24250
48	1	6	24790
50	4	4	25530
52	7	2	26270
60	3	6	28830
64	1	8	30110
70	6	5	32230
72	9	3	32970

Polar Evolution I-DLS



(A)
with ring spinning frame Zinser and Rieter =
845 mm

N. HEADS	SECTIONS		LENGTH mm
	6T	8T	
12	1	1	8645
14	2	1	9285
16	3	1	10025
18	2	1	10665
20	1	2	11305
22	3	1	11945
22	4	1	12045
24	3	1	12685
26	2	2	13325
28	1	3	13965
30	4	1	14605
32	3	2	15345
34	2	3	15985
34	6	1	16085
36	1	4	16625
38	5	1	17265
38	4	2	17365
40	3	3	18005
42	2	4	18645
44	1	5	19285
46	6	1	19925
48	3	4	20665

N. HEADS	SECTIONS		LENGTH mm
	6T	8T	
20	4	1	12045
22	3	1	12685
24	2	2	13325
26	1	3	13965
28	4	1	14605
30	3	2	15345
32	2	3	15985
32	6	1	16085
34	5	1	16725
36	4	2	17365
38	3	3	18005
40	2	4	18645
42	1	5	19285
44	6	2	19925
46	3	4	20665
48	2	5	21305
48	6	2	21405
50	5	3	22045
52	4	4	22685
60	8	1	25245
64	6	4	26725
70	3	7	28645
72	2	8	29285

N. HEADS	SECTIONS		LENGTH mm
	6T	8T	
30	6	1	16085
34	4	2	17365
36	3	3	18005
38	2	4	18645
40	1	5	19285
42	6	2	19925
44	3	4	20665
46	2	5	21305
46	6	2	21405
48	1	6	21945
50	4	4	22685
52	7	2	23425
60	3	6	25985
64	1	8	27265
70	6	5	29385
72	9	3	30125

COMPANY WITH
MANAGEMENT SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =
= ISO 14001 =

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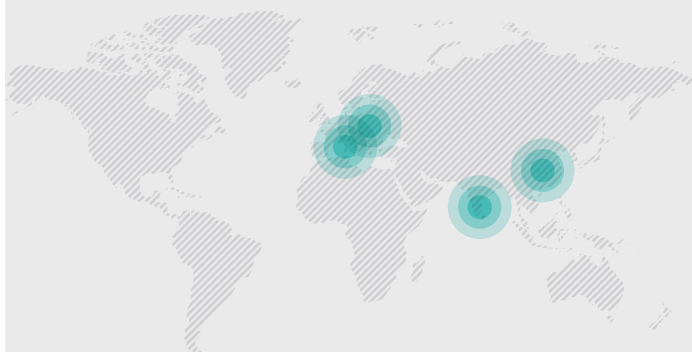
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We reserve the right to modify the characteristics of the machines described herein without prior notice. The data given in this brochure are not intended as a guarantee.

Savio machines are equipped with safety devices in compliance with existing regulations.

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