AUTOMATIC WINDER

EcoPulsarS *plus*

AUTOMATIC BOBBIN FEEDING TYPE

Savio

EFFICIENCY

TECHNOLOGY

QUALITY OUTPUT

AUTOMATED SOLUTION

AUTOMATIC WINDER

EcoPulsarS plus

AUTOMATIC BOBBIN FEEDING TYPE

Eco PulsarS plus: sustainable eco-green advantage.

The machine, with its sustainable eco-green advantage, replies to the markets demand of energy saving including room air conditioning, together with improved production performances, high quality packages and utmost flexibility.

MACHINE MODELS:
ECO PULSARS E
automatic bobbin feeding and doffing (Stand-alone system)
ECO PULSARS I/ DLS models
automatic bobbin feeding and doffing (Link system)

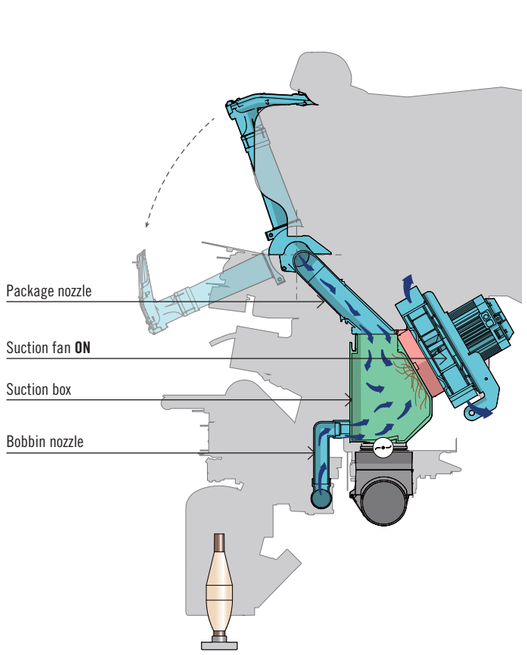
BENEFITS:

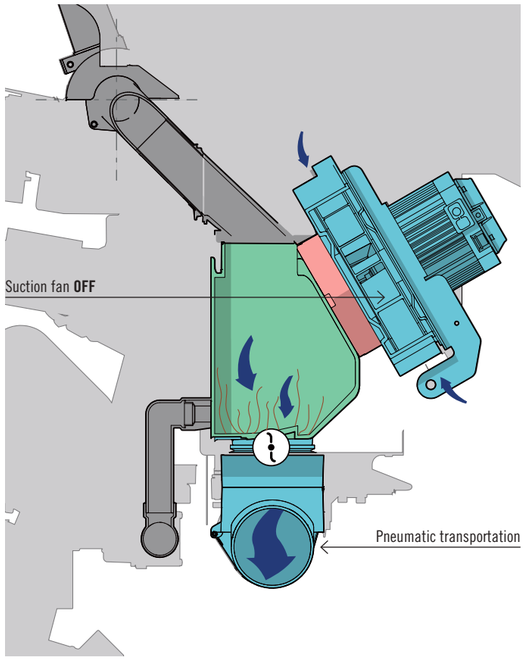
- Eco PulsarS with its innovative platform can save up to 30% power bill thanks to “Suction on Demand” system
- New Controlled Cut System to reduce repetitions
- Yarn Tension Control System: gate system /disc system for different fibers and finishing blends
- Innovative Waste Collection to reduce yarn waste
- Friendlier to the user: machine control and diagnostics

EFFICIENCY

The combination of all features and design of EcoPulsarS has created an environment in which each part of the machine can operate at its optimum efficiency without limitations. Spindles and bobbin feeding systems independently generate the level of suction required. Suction is generated as needed and used without losses. All new devices contribute to the overall reduction of process downtimes.

Suction on Demand System (S.D.S)
Energy savings up to 30%





The solution of the “individual and independent suction unit per spindle” represents a real break-through versus the conventional system.
Yarn suction is created and managed individually, only when required by the individual spindle and bobbin feeding system.

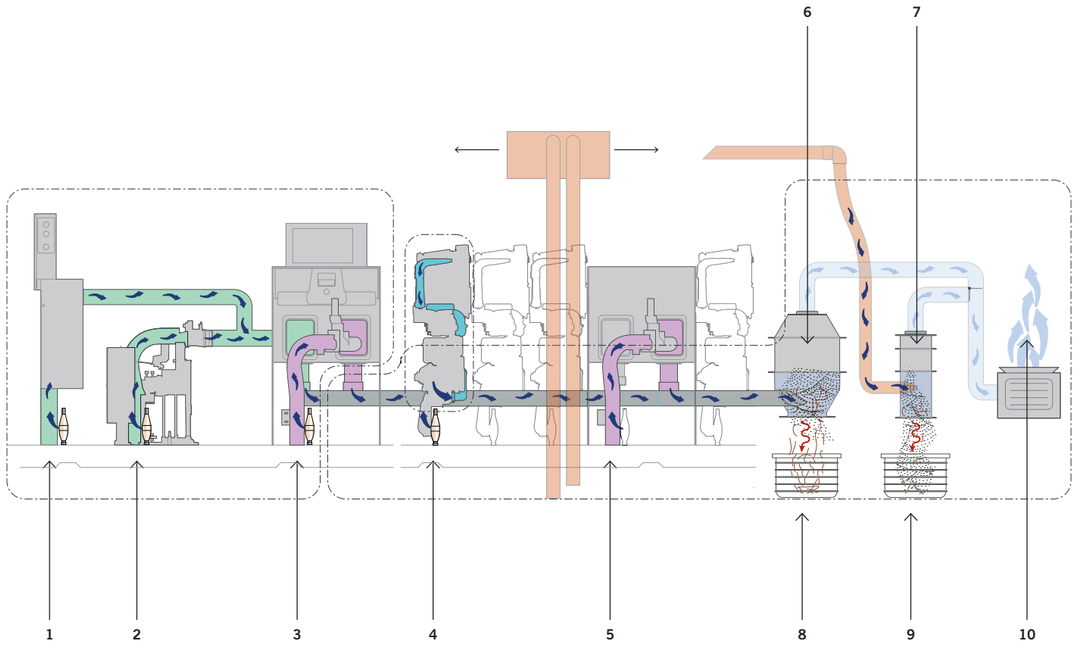
The self-sufficient units can individually optimize the suction required.
Each unit operates at optimum suction values without influencing the rest of the machine: this means no more compromises in balancing the suction as in conventional centralized systems.

Better efficiency, a smoother winding process and overall superior package and yarn quality.
Up to 30% power saving since suction is generated only when needed. Theoretically, no limitations on number of spindles per each machine.

Every single suction fan collects its yarn waste and dust in a dedicated suction box.

The individual spindle waste is evacuated when required through a centralized pneumatic transportation, to guarantee the cleaning with the lowest energy consumption.

Waste collection system



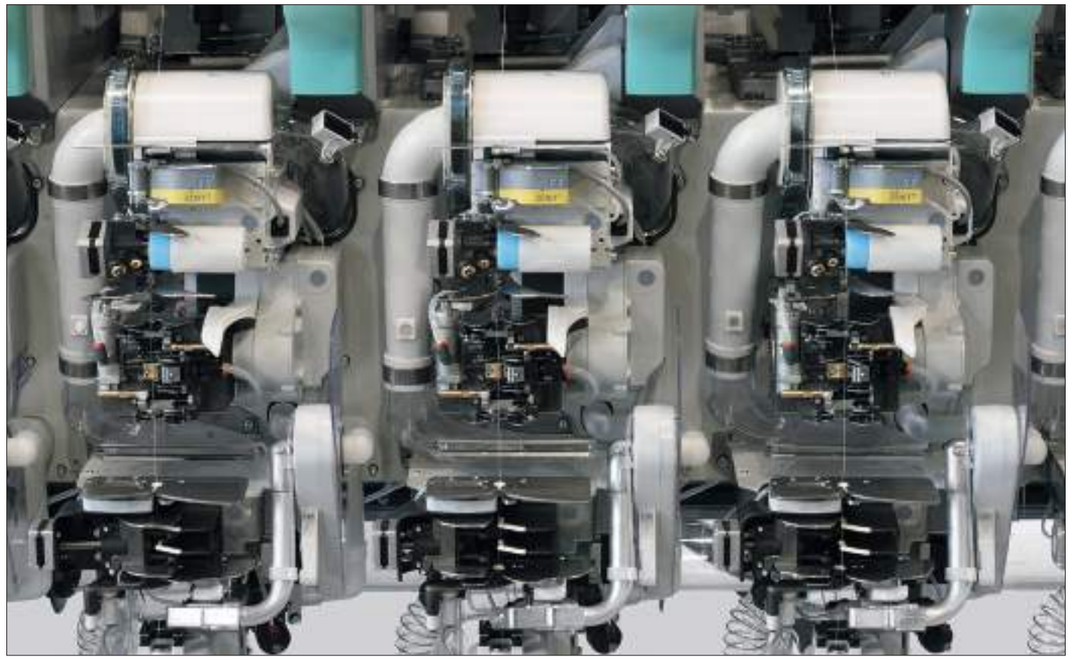
Every single suction unit collects its own yarn waste in a dedicated suction box. The waste is evacuated when required through a centralized system. The waste is discharged, without influencing the winding process, into an innovative waste collector. This waste collector allows a great eco-green advantage.

The exhausted air return cleaned and cooled into the winding room. **The spindles dedicated suction units are also independent from those of the yarn finders.**

Winding room air conditioning
The Suction on Demand System implies a sensible reduction on both the volume and temperature of the exhausted air. Air is filtered and discharged directly into the winding room: no need for underground or overhead ducts for reconditioning.
Compared to conventional systems, Eco PulsarS allows a significant reduction in size and capacity of the air conditioning plant.

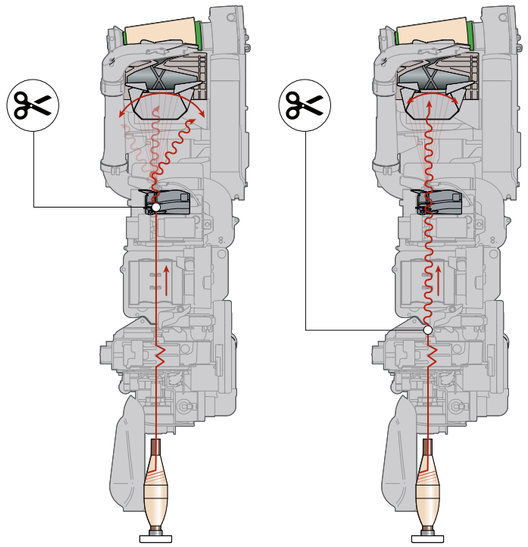
1 Tube stripper (optional)
2 Smart backup station (optional)
3 End finder station
4 Spindle unit
5 Auxiliary end finder station
6 Yarn waste collector
7 S.B.B. (Savio Belt Blower) waste collector
8 Machine yarn / Dust waste
9 Dust / Dirt S.B.B. (Savio Belt Blower)
10 Clean air

Controlled Cut System (C.C.S.)



The electronic clearer intervention represents a critical factor for the full control of the “cut yarn end”. The high winding speed process, lively and/or elastomeric core yarns, both can create a “spring-like rebound” of the yarn end: yarn might be trapped on package flanks and adapters. In this case, the splicer cycle becomes uncertain and with low efficiency rate, because of the difficulty to retrieve the end.
The “Controlled Cut System” C.C.S. with its yarn cut function, separated from the electronic yarn clearer detection, has an independent smart cutter, which works in synchronism with the winding process. In this way, the cut is controlled, being done only when the yarn is perfectly aligned with the middle drum traverse stroke.

The final effect assures that yarn end can be easily found and retrieved during the subsequent splicing cycle, with minimum suction, avoiding unnecessary repeating cycles that might also damage the package quality.
C.C.S guarantees that hard waste generation is reduced, while the cycle efficiency is increased and the operator intervention minimized.



Yarn cut function along with clearing

Yarn cut function separated from clearing

Yarn Tensioning System options

Availability to choose the most appropriate tensioning system in accordance with fibers materials and counts.

Yarn tension is controlled by a variable interference system, which works in synergy with the tension sensor. A precise step motor adjusts the interference in order to maintain the set tension. The system ensures total control of the yarn in all conditions, even in the case of slub or core/elastomeric yarns.

Gate tensioning
With this new principle sensitivity, tensioning range and reaction time have been enhanced.
A combination of fixed and movable ceramic fingers traps stabilizes the yarn allowing higher winding speeds. The friction points have been reduced and harmonized, in order to preserve the overall quality of the yarn.

Disc
Yarn tension is given by the discs load, in accordance with the tension sensor value, through an electromagnetic system.

Yarn clearing logic
Waxing

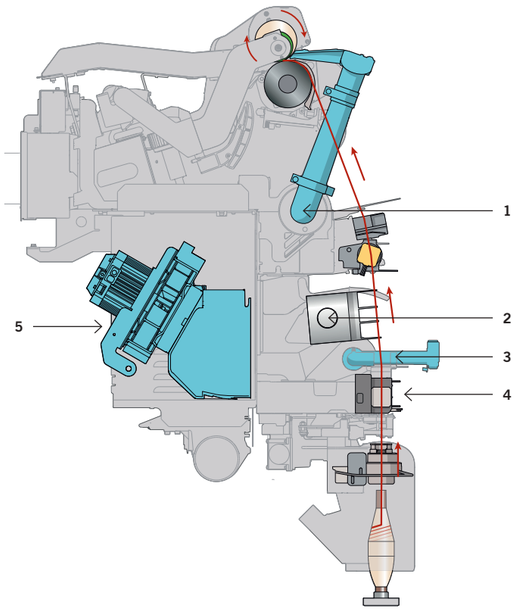
Yarn clearing logic
All the clearers of the last generation are totally integrated with the EcoPulsarS process logic. Each single spindle becomes a technological laboratory to ensure the production of a faultless package. In addition to the control of the main single or repetitive yarn defects, splice 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.

Waxing (optional)
EcoPulsarS system allows a very fine wax uniformity on the yarn, thanks to a dedicated step motor. The user can optimize the waxing, as both sense of rotation and speed are settable.
It is possible to select the position of the waxing device:
- above the clearer
- below the clearer (standard)

Double waxer: for wool and high quality materials (optional)
For particular yarns counts and materials, a double waxing device can be provided for a consistent waxing evenness to match knitting process requirements.

Smart and Flexible Cycle

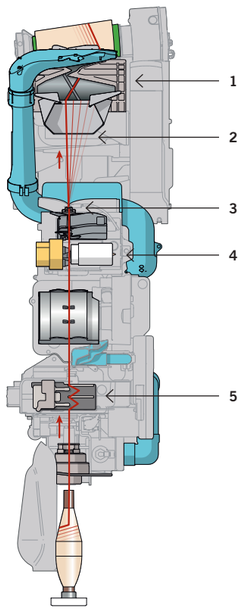


The Suction on Demand System gives the possibility of smart cycle settings in terms of suction values and timing, relevant to potential different splicers attempts.
The cycle time is also adjustable, in accordance with processed yarn type.
This smart flexibility is coupled with the flexibility coming from the individual and independent movements of each cycle devices.

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

1 Independent movement of the package yarn suction nozzle
2 Independent movement of the splicer
3 Independent movement of the bobbin yarn suction nozze
4 Independent movement of the yarn tensioner device
5 Suction fan

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 online the real winding tension. The sensor does not have any movable parts and performs as “anti-wrap system”.



Tensorflex (standard)
In presence of elastomeric yarn blended with any fiber, 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

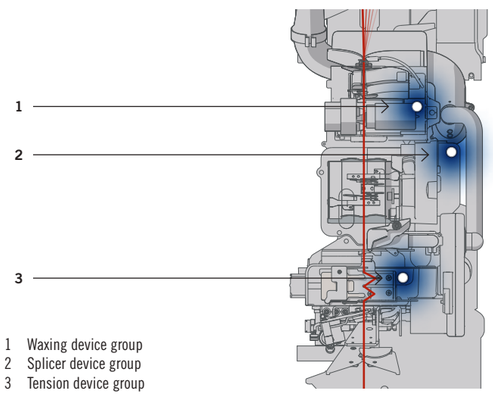
Yarn presence sensor (optional)
To minimize the yarn hard waste at cycle, a sensor, located inside the package suction pipe, detects the yarn presence and stops the drum reverse movement.
The suction vacuum is automatically adjusted in accordance with the reverse drum movement within a min. and max. value. This system allows energy savings and reduced cycle time.

Friendlier to the user
Machine control and diagnostics

Machine monitoring
Monitoring through the machine control panel with iconographic diagnostic.

Spindle monitoring
Each critical area of the spindle is equipped with a warning blue LED to pinpoint where the operator’s attention is required. Friendlier than complex alphanumeric codes based diagnostic solution.

Pc monitoring
Control panel with 15” industrial touchscreen PC prearranged for remote control connectivity. Integrated display for winder and electronic clearers settings and control.



1 Waxing device group
2 Splicer device group
3 Tension device group

TECHNOLOGY

A further step to catch up with the world of IT applications and the new textile synthetic and artificial fibers applications.

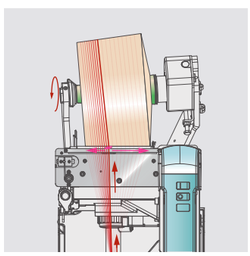
Multicone: the digital yarn layering technology

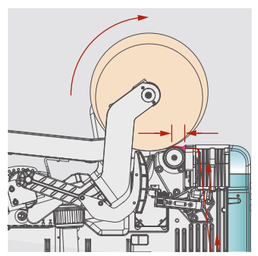
The different downstream processes require a wide flexibility in the wound package building, in order to optimize the specific efficiency. Packages for dyeing, warping, weft, knitting, double twisting, require a different and flexible package formation in terms of geometry, edges shape and density. “Multicone” 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 guarantees 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.

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).

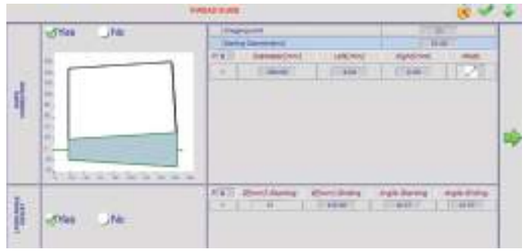
Density
In case of very fine single cotton yarn or finest wool for dyeing purposes, the machine can be equipped with the optional C.A.D. (Computer Aided Density).





Much closer to the package than any other pendulum system

EcoPulsarS Multicone
The winding mode and package shapes



Step-precision winding
Control of the distance between two consecutive layers, through the continuous variation of the winding angle within the different ranges (steps) of package diameters. This assures a consistent density and avoids any possible ribboning effect.

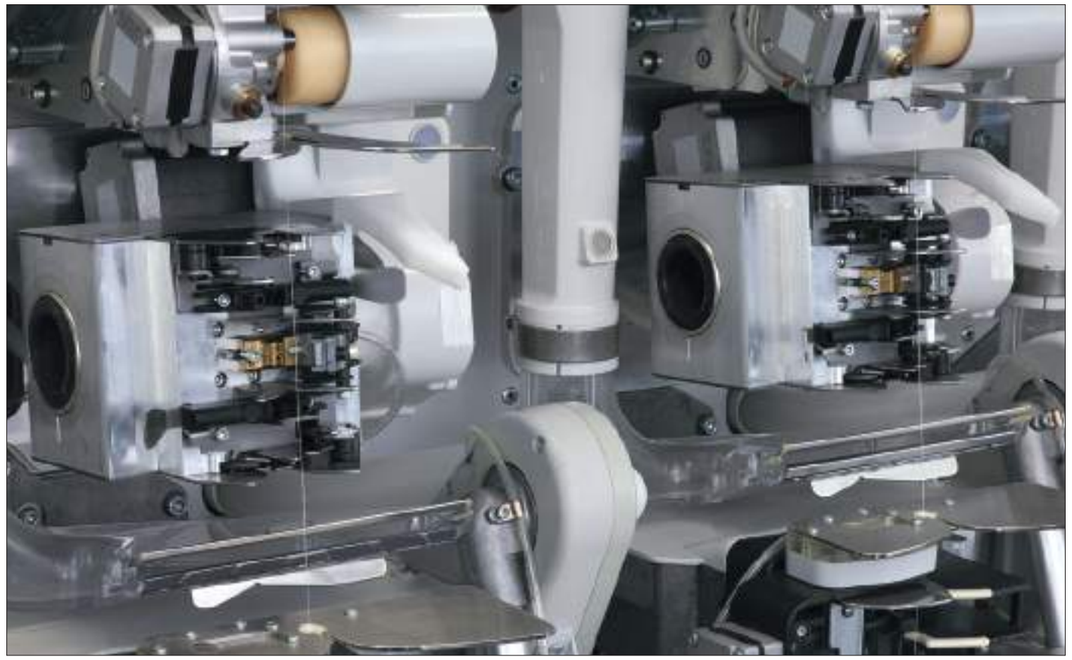
Traverse stroke
Infinite variation deposit modes permit the building of the package with any individual geometrical design (tapered-cylindrical-round edges-pineapple). Relatively to the take-up tube, symmetrical, left/right wise asymmetrical building.

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 computer 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.
On an advanced setting page, the user can interact with a visual interface on the PC screen for almost drawing the final package, by setting the stroke mode variations along the package diameters.
The user is able to customize and tailor the package design, according to his requirements for the downstream process.

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.

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

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

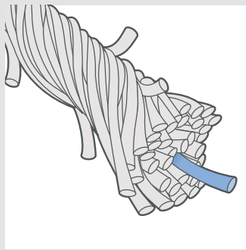
Water splicer (optional)
The splicing operation is made under vacuum while the water is injected (Duo-Stage). All the splicer parts are located in a “water proof” housing to avoid dangerous spray of water outside.

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

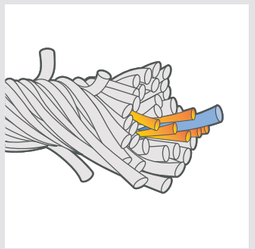
Core yarns

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 Eco PulsarS 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.



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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

Package formation

Electronic anti patterning system
It operates at critical diameters by modulating the drum speed. All the critical ratio 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 ±0,5%.

Package yarn quality control

The package quality is checked by direct control on the yarn, as the off-standard bobbins are controlled and rejected before starting to be wound. The off-standard yarn is thus prevented from going into the cone. Furthermore, the maximum number of splicer joints that can be present in the package can be set on the machine PC.
Package tracking with bio data (optional) can be also provided on request.

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 - ECOPULSAR I/DLS

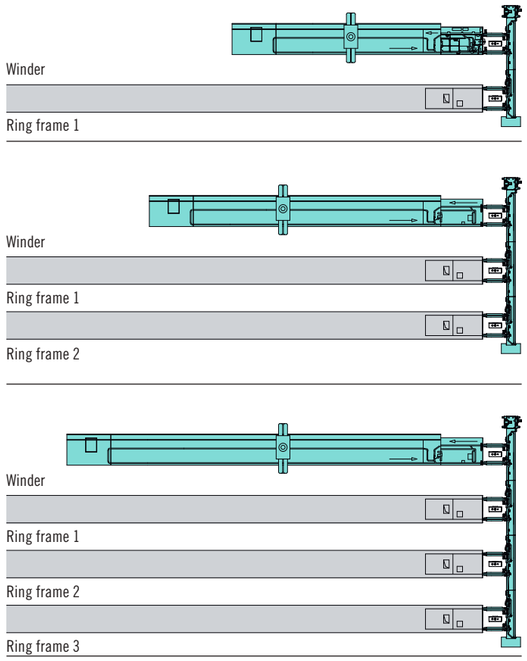
The Savio Direct Link System (I/DLS) solution, for linking the ring spinning frames (RSF) to the winders, enables a fast and efficient direct feeding of bobbins, along with the full interfacing flexibility with all kind of RSF (single or multistep).

The Eco PulsarS 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 of 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.

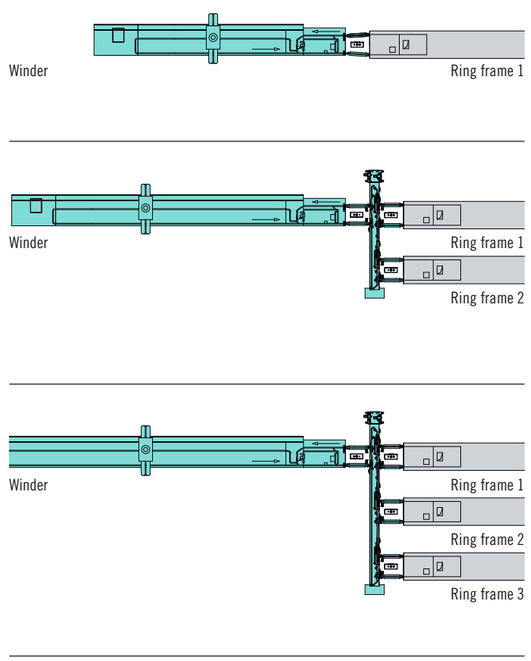
Multi Link - Classic or Underground Solutions
The requirement for integrated automation in the spinning process is increasing, leading Savio to offer customers new flexible link solutions, compared to the classic 1-to-1 configuration. Each winder can so be prepared to process 2 or 3 different yarn counts.

The latest solution from Savio is the **Multi Link**, which connects multiple ring spinning frames to one Savio winder, becoming a custom-made circuit. A special iPeg tray guarantees the circulation of RSF bobbin to/from winder. This solution optimizes space, reduces energy-consumption and production costs. It also shortens patrolling paths for the operators and allows a smooth 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 flow of RSF bobbing 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 tag reader prevents to process wrong yarn count in the wrong section, so avoiding a potential bobbin contamination.



Parallel Configuration



In-Line Configuration

End Finder Station
Yarn bobbins coming from the ring frame are automatically delivered to the end finder stations located along the machine. Each end finder station has its dedicated suction unit. The independence from the spindles circuit allows the generation of the optimum suction level, without any compromise with other services. In presence of the Smart Backup Station (optional) and/or the Tube Stripper (optional) devices, an additional independent suction unit is added.
Through PC settings, this system allows a dedicated and specific suction tunings without any compromise with other services. Each end finder station is positioned along the machine frame, allowing a complete operator monitoring and friendly intervention. The machine can be equipped with different numbers of end finder stations depending on capacity for longer ring frames. Thanks to the dedicated and independent suction system of the end finder stations, the utmost efficiency is guaranteed no matter the number of spindles and stations.

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 the bobbins with a high efficiency rate and removes 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 iPeg 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.

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

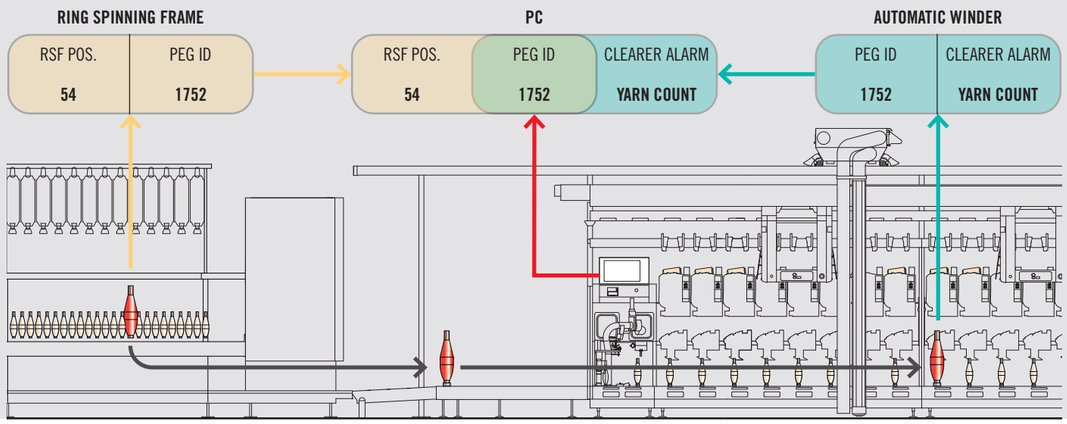
S.I.S. - Savio Identification System (optional)

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:

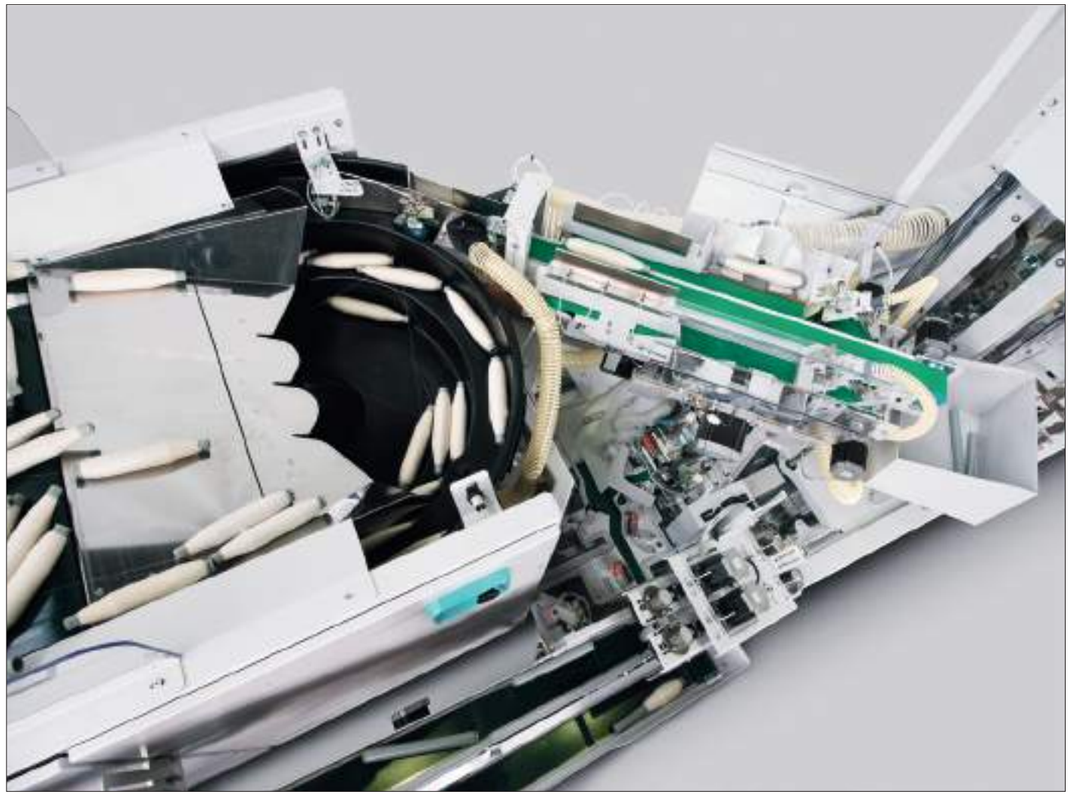
- Bobbins delivered to a dedicated technological parking area.
- Bobbins delivered to a selected winding head, and wound on **B-Grade packages**.
- Bobbins delivered to Back Up station (if present) for defects removal, and returned to winding head.
- Bobbins delivered to O.B.S. station to be unloaded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

FREE STANDING SYSTEM - ECO PULSARS E

Ring spinning frame bobbins are loaded into the hopper box and then transferred to the preparation station. Each bobbin is automatically moved to the yarn “end finder station”, in order to prepare it for the following winding process. All the above-mentioned operations are automatically made and “operator free”.



Hopper
The capacity has been increased thanks to the “double alternate” bobbin loading system. Bobbins are properly directed 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 that can cover the demand for even the longest winders.

Double Peg Feeding System
Double sleeves ensure the loading of the bobbins on the pegs.

Axial type End Finder Station
The end finder device has been engineered to easily handle also those bobbins with bad shape and construction. A movable ring generates air blow to disentangle the trapped end. A bunch remover cleans any rans 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° 3 end finder stations to serve machine up to n° 80 spindles.

End finder for elastomeric yarns (optional)
The core and double core yarn construction technology, needs a “lycra kit” configuration to reach the same efficiency as per standard yarns no matter the elasticity of the threads.
This configuration allows the possibility to process both standard yarns and core yarns (Universal End Finder).

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.

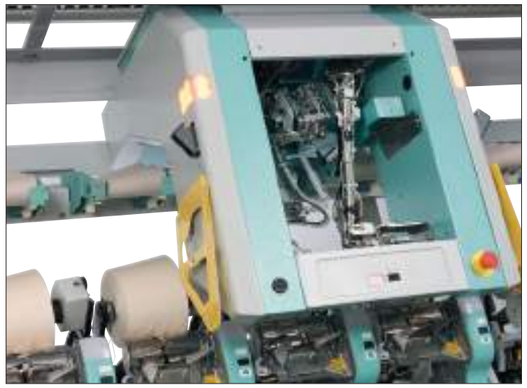
O.B.S. - Off Standard Bobbin Selector (optional)
In alternative to the bobbin stripper, the Off Standard Bobbin Selector removes bobbins with residual yarns. In presence of iPeg, the O.B.S. removes bobbins with technological alarms too.

Duo-Lot system (optional)

ECOPULSARS E
- Capability to process two different yarn lots with same tube dimension;
- The availability of highest number of winding heads per machine;
- The highest feeding capacity of bobbins pereach lot;
- The possibility of highest number of “end finder stations”;

Double hoppers (one for each lot)
Loading rate for feeding the longest machines.

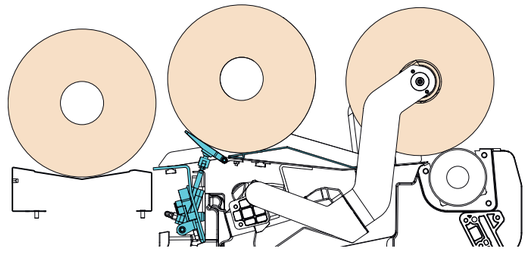
Doffing System



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.
- The universal clamp is able to handle different 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 tail 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 (optional)
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 BRACELETES
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.

P.T.S. - Package Tracking System (optional)
The package handling automation, external to the winding machine, may require the possibility to identify and monitor the package yarn quality.
For enhanced traceability and inventory management, we can offer a solution for package identification. A RFID tag is applied inside the package cone for uniquely identifying the product and track processes and operations. The external automation system, being provided with a reader, enables the selection and grouping of the packages on the pallets, creels or other supports.
This system is studied for product traceability and visibility in the assembly line, warehouse logistics management, inventories and reliable item level identity.

A dedicated winding room data collector receives all the information available from the machines.
The system generates a unique ID for each package. The ID is associated to the bio data of the package, which can be retrieved later for in-house tracking. The bio data can be stored in cloud-based applications and retrieved everywhere.
Machine computer can provide the Package Bio Data such as:

- **Product code**
- **Origin identity (machine serial number, spindle number)**
- **Date/time of production, shift information**
- **Lot name, winding speed, yarn count**
- **Length and weight**

TECHNICAL SUMMARY

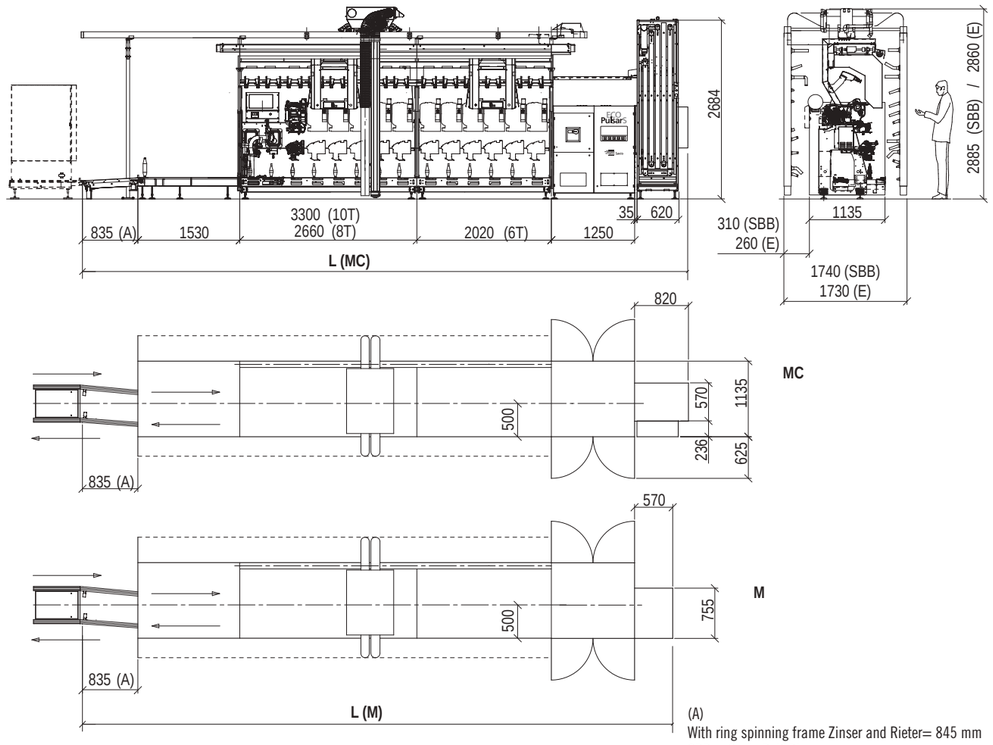
Savio has responded to the increasing requirements of automation by implementing fully automatic winding machines. Savio offers a wide range of winders with different levels of automated devices to overcome the shortage of labor, cut running costs and enhance the quality of the yarn product.

	E model	I/Direct Link System model
Features	Free standing winder. Automatic bobbin feeding and doffing (Stand-alone system)	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 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, 8 or 10 head sections.	
Number of heads/machine:	From a minimum of 12 to a maximum of 80.	
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 - Grooved drums	400 ÷ 2200 m/min with continuous adjustment.	
Take-up speed - Multicone	400 ÷ 1600 m/min with continuous adjustment.	

■ Standard ☐ Optional

	E model	I/Direct Link System model
WINDING UNIT		
Grooved drums	■	■
Individual spindle suction system	■	■
Electronic anti patterning system	■	■
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	■	■
Yarn defects cutter: separate cutter, located in the yarn tensioner	■	■
Duo Air Splicer System: Jointair type	■	■
Splicers: Water, Moistair®, Twinsplicer, Heat-Splicer, knotters	☐	☐
Yarn tensioner: gate system/disc system according to fibers and blends	■	■
Pre-clearer: variable width	■	■
Tensor - C.A.T. Computer Aided Tension	■	■
Yarn presence sensor	☐	☐
Waxing unit, deflection type	☐	☐
Double waxing units	☐	☐
Wax finished detection probe	☐	☐
Booster: tension reducer	■	■
C.A.M. Computer Aided Metering	☐	☐
C.A.P. Computerized control of the drum-package diameter ratio	☐	☐
Counterweight: standard pneumatic device	☐	☐
C.A.D. Computer Aided Density	☐	☐
Diagnostics: with colored LED fitted on the winding head functional groups	■	■
Dust removal: through a suction nozzle aside the bobbin and standard suction pipes along the yarn path, by the individual suction unit.	☐	☐
MACHINE BODY		
Package conveyor belt: single lot towards the headstock	■	■
Belt cleaning system: for the belts of the machine body and bobbin loading station	■	■
Lighting along the machine	☐	☐
Travelling blower/suction unit	■	☐
Waste yarn and dust collection system: through a collector along the machine towards the headstock	■	■
Package B-Grade System	☐	☐
Centralized pneumatic adjustments: located near the computer, for package cradle counterweight and splicer air pressure	■	■
COMPUTER		
Centralised electronic adjustments: machine data, processing parameters, air splicer working parameters (Duo Air types only), yarn tensioner pressure, V.S.S., electronic modulation, pneumatic adjustments values	■	■
Setting, collecting and displaying production data: of winding units, bobbin loading station, doffing trolley, display of the peripheral alarms	■	■
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	☐	☐
P.T.S. Package Tracking System: for enhanced traceability and inventory management, a RFID tag is applied inside the package cone for uniquely identifying the product and track processes and operations.	☐	☐
HEADSTOCK		
Machine Control Panel	■	■
Waste discharge: by filters at the headstock end, automatic discharge into external separated boxes, without stopping the machine	■	■
BOBBIN LOADING STATION		
End finder station	■	■
Additional End finder station	☐	☐
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		☐
O.B.S. - Off Standard Bobbin Selector	☐	☐
Tube cleaner	☐	☐
BOBBIN FEEDING		
Bobbin loading: tipper located along the machine's axis and vibration system to thin out bobbins	■	
Duo Lot system: capability to process two different yarn lots	☐	
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.		☐
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	☐	☐

OVERALL DIMENSIONS
EcoPulsarS I - Direct link system



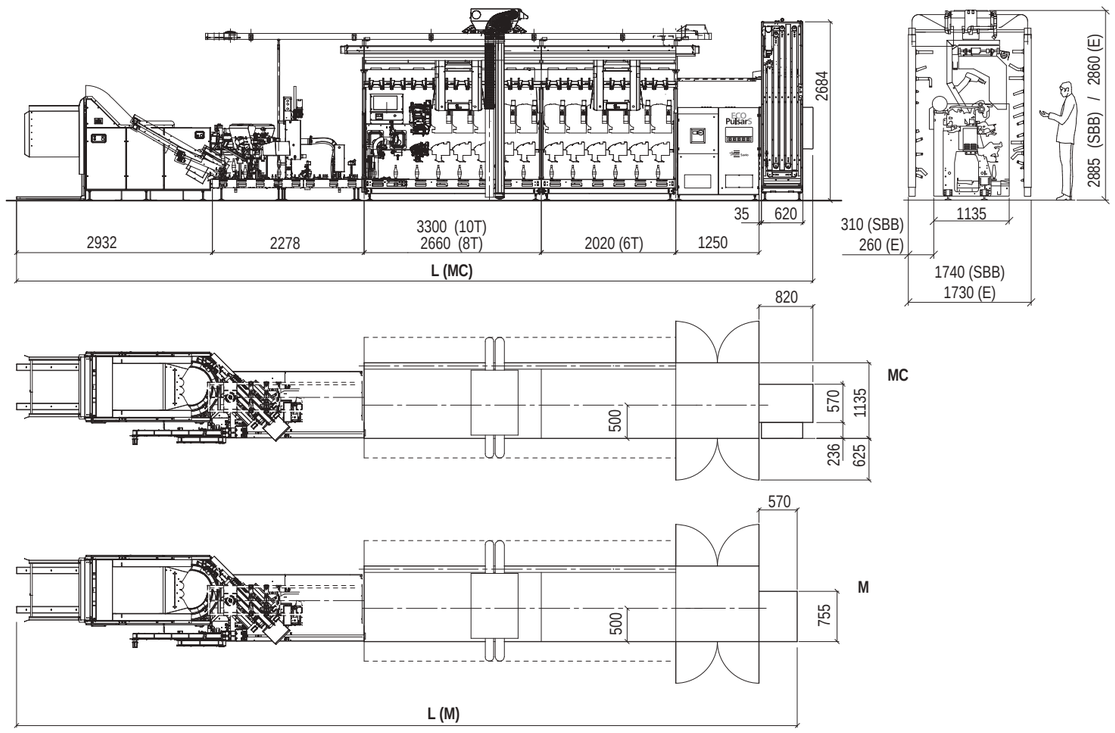
(A)
With ring spinning frame Zinser and Rieter= 845 mm
SBB = Savio Belt Blower
E = Electrojet

WITH 1 END FINDER STATION					
N. HEADS	SECTIONS			LENGTH	
	6 H	8H	10H	MC	M
18			2	11035	10785
20	1	2		11775	11525
22		3		12415	12165
24		2	1	13055	12805
26		1	2	13695	13445
28			3	14335	14085
30		4		15075	14825
32		3	1	15715	15465
34		2	2	16355	16105
36		1	3	16995	16745
38			4	17635	17385
40		4	1	18375	18125

WITH 2 END FINDER STATION					
N. HEADS	SECTIONS			LENGTH	
	6 H	8H	10H	MC	M
32		2	2	16355	16105
34		1	3	16995	16745
36			4	17635	17385
38	1	2	2	18375	18125
40	2	4		19115	18865
42	1	5		19755	19505
44		6		20395	20145
46		5	1	21035	20785
48		4	2	21675	21425
50		3	3	22315	22065
52		2	4	22955	22705
54		1	5	23595	23345
56			6	24235	23985
58		4	3	24975	24725
60		8		25715	25465
64		6	2	26995	26745
70		3	5	28915	28665
72		2	6	29555	29305

WITH 3 END FINDER STATION					
N. HEADS	SECTIONS			LENGTH	
	6 H	8H	10H	MC	M
70		7	2	29655	29405
72		6	3	30295	30045

OVERALL DIMENSIONS
EcoPulsarS E



WITH 1 END FINDER STATION					
N. HEADS	SECTIONS			LENGTH	
	6 H	8H	10H	MC	M
18			2	13880	13630
20	1	2		14620	14370
22		3		15260	15010
24		2	1	15900	15650
26		1	2	16540	16290
28			3	17180	16930
30		4		17920	17670
32		3	1	18560	18310
34		2	2	19200	18950
36		1	3	19840	19590
38			4	20480	20230
40		4	1	21220	20970

WITH 2 END FINDER STATION					
N. HEADS	SECTIONS			LENGTH	
	6 H	8H	10H	MC	M
32		2	2	19200	18950
34		1	3	19840	19590
36			4	20480	20230
38	1	2	2	21220	20970
40	2	4		21960	21710
42	1	5		22600	22350
44		6		23240	22990
46		5	1	23880	23630
48		4	2	24520	24270
50		3	3	25160	24910
52		2	4	25800	25550
54		1	5	26440	26190
56			6	27080	26830
58		4	3	27820	27570
60		8		28560	28310
64		6	2	29840	29590
70		3	5	31760	31510
72		2	6	32400	32150

WITH 3 END FINDER STATION					
N. HEADS	SECTIONS			LENGTH	
	6 H	8H	10H	MC	M
70		7	2	32500	32250
72		6	3	33140	32890

WITH 4 END FINDER STATION					
N. HEADS	SECTIONS			LENGTH	
	6 H	8H	10H	MC	M
72			8	33680	33430

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

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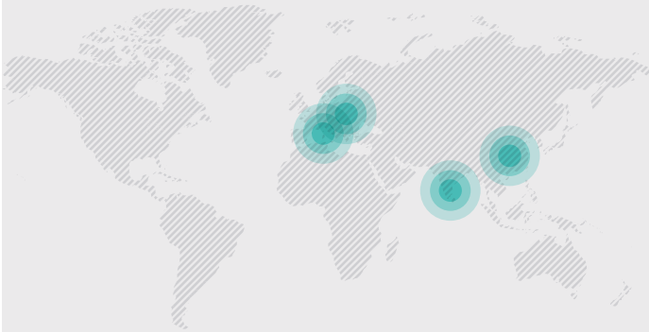

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