

# Rieter - G 35 Ring Spinning Machine



## CONVINCING NEW FEATURES

5 Quality extending over 1 632 spindles

## ECONOMY

6 Potential savings with large numbers of spindles

## QUALITY

7 Technological optimization

## FLEXIBILITY

9 Centralized, ergonomic machine operation

11 Well-conceived drive systems

## ENERGY CONSUMPTION

12 G 35 – the machine with the best energy balance

## AUTOMATION

14 Efficient cop change

15 Flexible logistics

## PRODUCTION TECHNOLOGY OPTIONS

16 SPIDERweb

17 ISM – Individual Spindle Monitoring

## SPINNING TECHNOLOGY OPTIONS

18 VARIOspin

18 Core Yarn System

## RIETER TECHNOLOGY COMPONENTS

19 Ri-Q-Cots

19 Ri-Q-Tubes

19 Rieter traveling cleaner



The G 35 ring spinning machine is a further milestone in Rieter ring spinning technology and combines market-proven functions of the G 33 predecessor model with further optimizations and innovations. Customers benefit from a powerful, high-quality machine incorporating diverse additional solutions in the field of spinning technology. Superiority over competitors ensures market success.

## HIGHER PRODUCTIVITY – UP TO 1 632 SPINDLES

The new G 35 is modular in design, and the total machine concept offers maximum reliability and flexibility with up to 1 632 spindles.

## IMPROVED ECONOMY

A larger number of spindles per machine means lower costs in producing a given volume of output; fewer machines incur lower capital costs and reduced expenditure for infrastructure and maintenance (space requirements, energy, air conditioning, etc.). This reduces the fixed element of production costs per kg of yarn.

## POSITIVE ENERGY BALANCE

Top priority has been given to reducing energy consumption

– a core element of manufacturing, maintenance and operating costs. The G 35 rates as the ring spinning machine with the best energy balance.



Quality extending over 1 632 spindles

The G 35 ring spinning machine is based on the well-established G 33 predecessor model. The cornerstones of its success – a well thought-out machine concept, technically and technologically accomplished solutions and a high level of operator friendliness – have been incorporated to a large extent in the new model. Process control is thus assured.

**EASY OPERATION**

All machine functions are incorporated in the process control system and can be operated centrally via the Rieter control panel. Technical data relevant for spinning operations are displayed clearly and practically on a screen with graphic capability. For maximum efficiency and reproducibility, MEMOset enables all important parameters for up to 18 yarns to be filed in the data memory and retrieved at any time. The machine can be adapted rapidly and reliably to new products.

**HIGH FLEXIBILITY**

The FLEXIdraft drafting system drive enables yarns to be produced in defined, consistently high quality, even with frequent batch changes. Yarn counts and twist rates can be adjusted rapidly to new yarn products at the push of a button. Individual actuation of both sides of the drafting system cylinders, which are divided in mid-machine, and an additional intermediate drive for the central bottom roller on machines with more than 1 200 spindles ensure high running accuracy and quality consistency at all times.

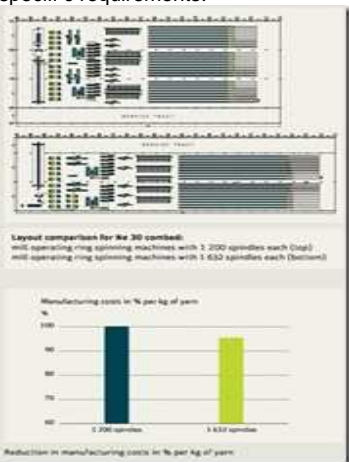
**DEFINED YARN QUALITY**

The mill-proven Ri-Q-Draft drafting system with pneumatically loaded guide arm and the Ri-Q-Bridge for superior spinning conditions provide a sound basis for high yarn quality. Fiber guidance in the main drafting zone has been further optimized on the G 35 with Ri-Q-Draft35.

**THE MOST RELIABLE DOFFER – WITHOUT INTERMEDIATE STORAGE Up to 1 632 cops are doffed** reliably, rapidly and without intermediate storage – even with large cop formats.

SERVogrip – the Rieter innovation for genuine doffing without underwinding – eliminates underwound ends and considerably reduces fiber fly on ring spinning machines. As a consequence the number of air changes in the spinning premises can be reduced, costs can be cut and yarn quality improved. This high-quality yarn results in fewer faults in subsequent processes.

ROBodoff – the Rieter doffing system guarantees maximum operating reliability. The doffing process is actuated automatically and monitored continuously throughout its operation. The starting and completion time of the doffing process in relation to spin-out and start-up can be programmed to meet the customer's specific requirements.



A machine operates economically when it generates a cost benefit per unit produced or an advantage compared to other systems. Low operating and maintenance costs as well as a long service life are assured by the high quality and reliability of Rieter machines. Continuous innovation ensures a market lead.

**REDUCED SPACE REQUIREMENT**

With larger numbers of spindles per machine the space required in a ring spinning mill for a defined output volume is reduced. The requirements for a ring spinning installation with 30 000 spindles are:

Space required

25 machines with 1 200 spindles each 11 300 m<sup>2</sup>

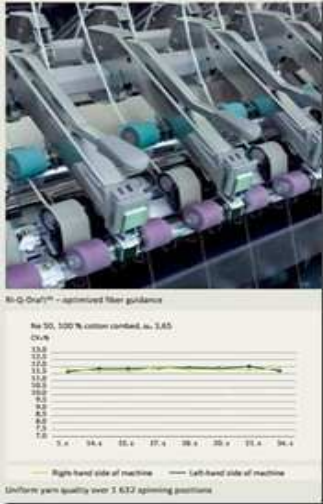
18 machines with 1 632 spindles each (G 35) 9 800 m<sup>2</sup>

This results in a reduction of 13 % in total floor area required. In addition to the cost of the building, running costs for maintenance, cleaning, lighting and air conditioning are lower.

Additional savings are possible in upstream or downstream processes if the actual number of machines in use there

can also be reduced. As a systems supplier, Rieter fulfills all the preconditions for upstream processes to provide timely supplies of the higher output volumes.

In the above-mentioned example, 7 fewer winders are required for the G 35 installation combined with automatic winders (Link system), i.e. the same number as for the ring spinning machines.



When does a machine spin high-quality yarn? When not only the quality at an individual spinning position fulfills the highest standards, but quality consistency over the total length of the machine and during the entire production period is also assured. In addition to technology components and spinning geometry, the machine concept and components such as drive, extraction, creeling and the doffing system are therefore also important for yarn quality.

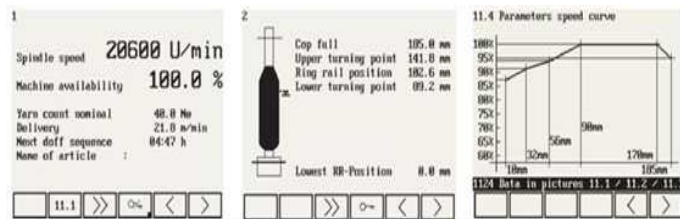
**OPTIMUM SPINNING GEOMETRY**

Spinning geometry affects not only yarn quality but also the running properties of the material. The interaction of the angles, the thread path and the ring/traveler system is crucial for yarn quality, ends down rates and production speeds.

**OPTIMIZED THREAD GUIDANCE**

Thread guidance in the drafting system also has a decisive influence on yarn quality and running properties. The mill-proven Ri-Q-Draft drafting system with pneumatically loaded guide arm and the Ri-Q-Bridge provides the basis for this.

Thread guidance in the main drafting zone is improved and even higher consistency achieved at all critical points of yarn production through optimum coordination of cage lengths with draft distances. Optimized thread guidance with Ri-Q-Draft35 is a convincingly well-conceived, mill-oriented drafting system solution.



**Centralized, ergonomic machine operation**

An operator-friendly, ergonomic operating and display concept has been developed in cooperation with users in the major markets as standard equipment for all Rieter machines. The main emphasis is on clear layout, good legibility and comprehensibility with a choice of 10 languages to ensure reliable man-machine communication.

**SIMPLE, EFFICIENT FUNCTIONS ON THE CONTROL PANEL** Machine functions, spindle drive, FLEXIdraft, ROBOload and traveling cleaners are centrally controlled. This enables all functions to be operated via a centralized operating and display unit. Maximum process control and real-time information regarding output and machine status are guaranteed. Adjustments, e.g. of yarn twist, can be made via the numerical keyboard. Modifications to machine data can therefore also be made quickly and efficiently for a change of blend.

**SIMPLE GRAPHIC OPERATOR INTERFACE**

Machine operation is facilitated by visualization of the current process status, easy retrieval of the relevant spinning data and displays of faults on the screen with graphic capability. The description and additional graphic display make the messages clearly understandable and self-explanatory.

**IMPORTANT PROCESS INFORMATION IN SUMMARY**

The basic display on the operator interface shows the current machine status at all times. The main input fields can be accessed directly by means of soft keys. The time remaining to the next doffing process is indicated directly on the basic display. This facilitates the allocation of personnel and improves machine efficiency. The spinning process can be

influenced directly while the machine is running by manipulating the graphs on the control panel. The new input points on the spindle speed graph therefore provide opportunities for even greater raw material and yarn-specific optimization.

**SPINNING PARAMETERS RETRIEVABLE AS YARN PRODUCTS** The MEMOset product module stores spinning parameters for up to 18 different yarns. The data are available at all times and

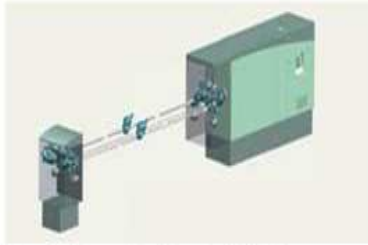
can be retrieved and processed on the monitor. The parameters are downloaded directly from a laptop, as a transfer between several machines or via a USB

interface.

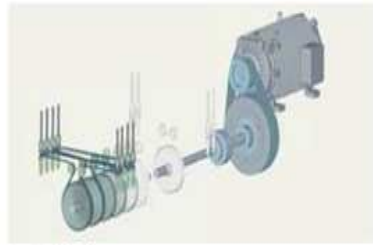
A new product is thus configured only once and is then available to all users and machines – a contribution to enhanced efficiency and quality consistency.

### RAPID TROUBLE-SHOOTING

Fault signals during the production process are displayed graphically on the control panel. Complemented by brief, explanatory texts, this enables the faults to be located quickly and systematically rectified.



Mid-machine drive on machines with more than 1 200 spindles



4-spindle belt drive



### Well-conceived drive systems

When do long machines also produce flexibly?

When batch changes do not entail disproportionately long downtimes and when a problem at a single spinning position does not necessitate shutting down the entire machine, thus resulting in a drastic loss of production. The G 35 offers all of this.

### ENERGY-SAVING 4-SPINDLE BELT DRIVE

The 4-spindle belt drive guarantees constant rotation speeds over the total length of the machine, regardless of the number of spindles. The greater angle of wrap around the wharve compared with other drive systems significantly reduces the tendency to slip, and the tension and contact pressure of the belt can be reduced. The outstanding energy balance of the 4-spindle belt drive has already been demonstrated on the previous machine generation in comparisons with other systems. The high efficiency values calculated have been confirmed in mill operations.

### NEW DRIVE CONCEPT

Bottom rollers are subject to material-specific torsion. Calculations and experimental values show that this causes faults during spinning start-up and spin-out as of a certain loading level and a critical bottom roller length. This is taken into

account in the G 35 with a modular drive concept. A single-sided drive is sufficient for short machines with up to 624 spindles.

Machines with up to 1 200 spindles are driven from headstock and tailstock. The division of the drafting system cylinders in mid-machine reduces torsion and ensures high running accuracy and drafting action.

On machines with more than 1 200 spindles the three bottom rollers of the drafting system are driven not only from the headstock and tailstock, but also from mid-machine in order to reduce torsion. This drive concept also enables manmade fibers and materials that are difficult to draw to be processed without any difficulty on the longest machines.

**FLEXIDRAFT – PARAMETER CHANGES AT THE PUSH OF A BUTTON** All three bottom rollers of the drafting system are frequency-controlled and individually driven by synchronous motors. FLEXIdraft enables yarn count and yarn twist to be changed at the push of a button. This drive concept for the drafting system is the precondition for the installation of FLEXIstart.

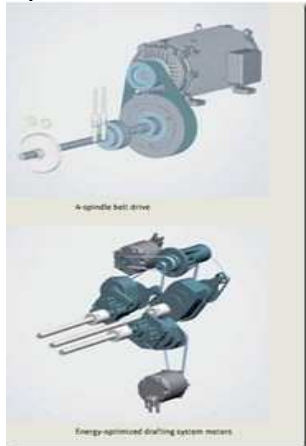
### FLEXISTART – EASIER BATCH CHANGES

Based on FLEXIdraft and the central division of the drafting system rollers, each drafting system drive can be started or stopped individually with the FLEXIstart function. The advantages of this are:

- time-saving start-up and spin-out of the machine
- significantly reduced material losses and soiling
- optimized personnel deployment
- ideal for spinning samples

On machines with up to 1 200 spindles start-up or shutdown with FLEXIstart occurs in quarters, on longer machines in half sides.

**CHANGING YARN TWIST DIRECTION AT THE PUSH OF A BUTTON** Yarn twist direction is changed from S to Z or vice versa – apart from spinning technology adjustments on the machine – also at the operator panel, without any mechanical intervention.



### ENERGY CONSUMPTION

G 35 – the machine with the best energy balance

Developments to reduce energy consumption in yarn manufacturing have been vigorously pursued for years with top priority in the research and development of Rieter textile machinery. Energy consumption figures lower than those of other systems available on the market were already achieved by means of highly accomplished technical and technological solutions on the G 33 predecessor model. The G 35 offers customers new and optimized functions with significantly reduced energy consumption.

#### 4-SPINDLE BELT DRIVE

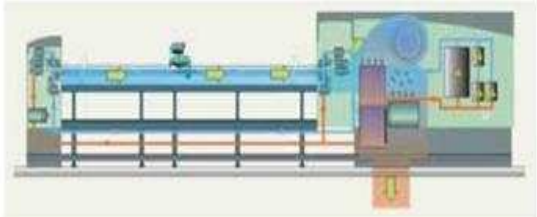
Mill operations have demonstrated clear benefits in terms of energy consumption for 4-spindle belt drives compared to tangential drives: a smaller wharve diameter and greater angle of wrap enable slip to be prevented and constant drive conditions to be guaranteed, despite lower belt tension. Customers also benefit from simple, rapid belt replacement.

#### ENERGY-OPTIMIZED DRAFTING SYSTEM MOTORS

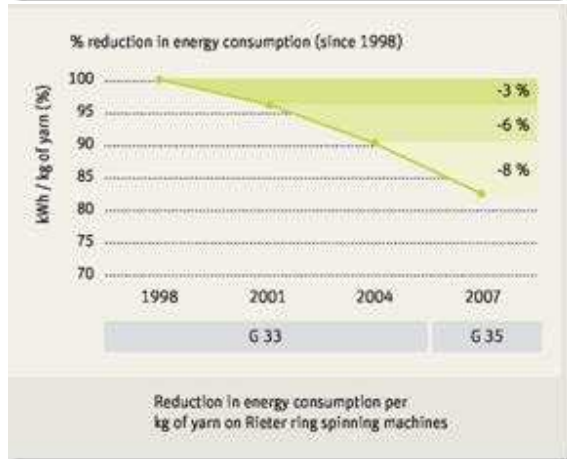
The use of newly developed electric motors for the drafting system drive results in higher efficiency and has a decisive impact on the machine's total energy consumption.

#### EFFICIENT EXTRACTION SYSTEM

The flow characteristics of the extraction system on the G 35 have been optimized for machine lengths up to 1 632 spindles. The reduction in pressure loss achieved in this way ensures an adequate partial vacuum over the total length of the machine. Vacuum sensors in the rotating fiber separator control the cycle time for the rotation and ensure uniform vacuum conditions throughout cop running time.



INTERcool – integrated cooling circuit



#### INTERCOOL

INTERcool is a closed-circuit cooling system integrated in the machine. The waste heat from the motors and frequency converters passes over an internal heat exchanger and then directly into the exhaust air ducts of the air conditioning system. The load on the air conditioning system is reduced, since the spinning premises are not subject to uncontrolled heating by the machines in operation. A constant spinning climate over the machine as a whole has a positive impact on running properties and yarn quality.

#### TRAVELING CLEANER WITH ENERGY-SAVING PROGRAM

The running cycle of the traveling cleaner can be programmed individually, depending on blend, fiber content in the air and the tendency to contamination by fly on the machine. The finer the yarn, the longer the cleaning intervals that can be selected. The cleaning cycles of the traveling cleaner are generally set for coarse count yarns and can be reduced for fine count blends to save energy.

#### MONITORING SYSTEM FOR POWER FAILURES

Power outages are usually synonymous with ends down, loss of output, loss of quality and intervention by personnel.

This is not so on the G 35. A monitoring system supervises power supplies. In the event of a power failure – and regardless of its duration – the spindle drive motor switches to the generator function and supplies the other drives while they decelerate. In the case of power interruptions lasting up to 2 seconds, the machine accelerates to operating speed again without stopping. In the case of failures lasting more than 2 seconds, the machine decelerates in a similar fashion to a process-related machine stoppage. This prevents ends down when the machine restarts.

#### Efficient cop change

Ring spinning machines are continually increasing in length and becoming ever faster. Both of these factors together make solutions for replacing and removing full cops increasingly important. The goal is to reduce machine downtime, since production is at a standstill during the doffing process. The G 35 guarantees good handling, well-conceived, ergonomically logical and individually adapted, automated solutions and fast, reliable performance of the complete doffing functions.

#### SERVOGRIP –TROUBLE-FREE DOFFING

The SERVOprip clamping crown, patented by Rieter, is the convincing, mill-proven solution for a smooth doffing process with a minimum of fiber fly.

Decisive advantages of SERVOprip are:

- yarn savings due to the elimination of reserve windings
- no mechanical removal of yarn residues
- elimination of series of ends down during manual or mechanical removal
- reduction of fiber fly on the machine and in the spinning premises

- fewer impurities in the yarn – higher quality
- reduced cleaning of machines and spinning premises

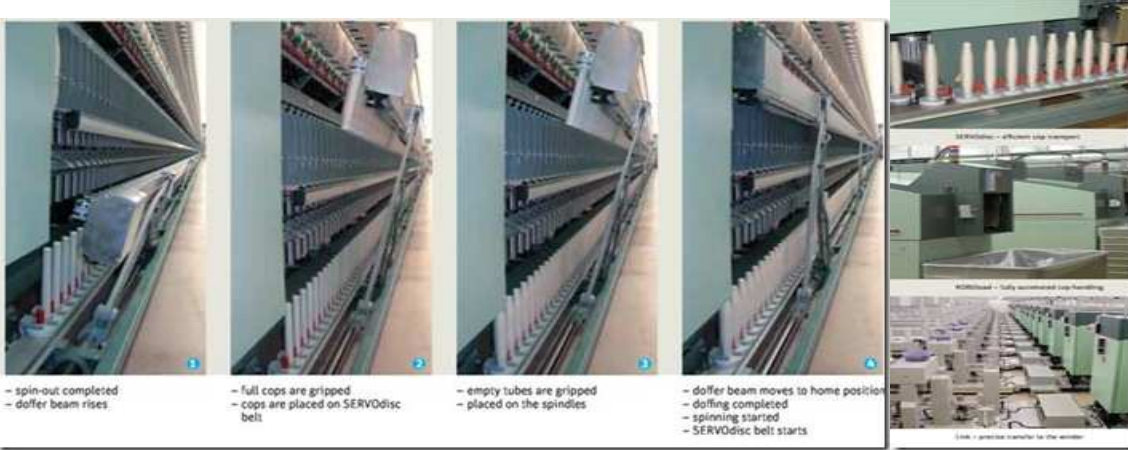
Reliable, defined breaking of the clamped yarn during the doffing process is guaranteed, even with especially tear-resistant yarns. Special support functions, such as draft and yarn count adjustment during reserve winding, can be programmed and optimized at the operator control panel.

#### ROBODOFF – MAXIMUM OPERATING RELIABILITY

The need for maximum operating reliability during doffing has increased further with the extension of the machine to more than 1 600 spindles; this is no problem with ROBODOFF. The self-monitoring doffer operates quickly and reliably, performing movements precisely and uniformly. The power required to move the doffer beam is provided by intelligent drives in mid-machine and relief springs distributed along its length.

#### DOFFLOCK – SAFETY IN SMALL SPACES

DOFFlock is a safety function for ring spinning installations with close machine spacing. It prevents simultaneous doffing on two neighboring machines, averting collisions and protecting personnel. This option is recommended where machines are installed 2 meters apart (between centers) and mandatory with spacing of less than 1.85 meters.



#### AUTOMATION

Flexible logistics

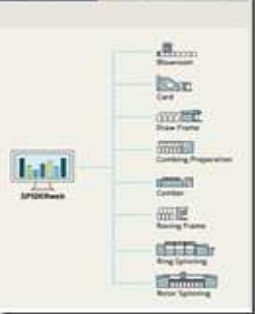
#### SERVODISC – EFFICIENT COP TRANSPORT

The doffer transfers the full cops to the SERVODisc transport system, which conveys them either to the transfer station of the winder or to the fully automated ROBOLoad tube loader. The SERVODisc discs prevent tilting and thus ensure smooth transport, while the machine already resumes yarn production.

#### ROBOLOAD – RELIABLE AUTOMATION

ROBOLoad has established itself as a reliable, fully automated tube and cop handling system for unlinked machines. Full packages are removed into a waiting container and empty tubes are fitted with a transfer capacity of up to 32 cops per minute. ROBOLoad impresses by virtue of its well-conceived design and reliable automation, and can be converted at any time into a Link station for automatic transfer of the cops to the winder.

The mill-proven design of SERVODisc, ROBOLoad and the Link station prevents the accumulation of fiber fly and ensures smooth, maintenance-free operation.



#### MILL MONITORING SYSTEM

#### SPIDERweb

Rieter has developed an innovative information and data collection system in the shape of SPIDERweb. Machines and the data system come from a single source and are ideally coordinated with each other. Due to the modular structure of SPIDERweb any number of machines can be connected, from blowroom to spinning installation. The open-ended network enables additional machines or SPIDERweb workstations to be connected at any time. SPIDERweb collects comprehensive data that provide an ongoing basis for business decision-making.

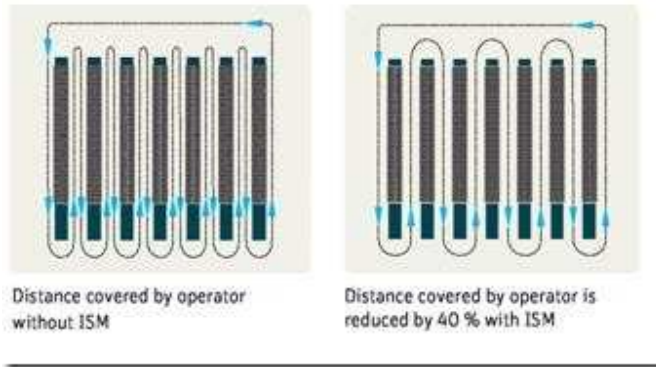
All data, including those from the individual spindle monitoring system (ISM), are stored centrally and enable a wide variety of statistical evaluations and analyses to be performed. With SPIDERweb the entire spinning mill can be monitored directly via PC. Running behavior, machine efficiency, machine allocation, etc., can be tracked and analyzed.

**SPIDERweb provides clearly laid-out displays of the following statistics:**

- efficiency of each individual spinning position
- number and duration of - startup ends down - natural ends down - slipper spindles

Diagrams and tables:

- current readings
- machine efficiency
- production efficiency
- production diagrams
- trend diagrams
- ISM trend diagrams
- shift report
- spinning position overview
- system report
- chronological machine messages, machine status and machine information



## INDIVIDUAL SPINDLE MONITORING SYSTEM

ISM – Individual Spindle Monitoring



## TOTAL, CONTINUOUS SPINDLE MONITORING

Online monitoring of quality and output is the key to optimum utilization of resources in the spinning mill. Only by monitoring each individual spinning position can the production process be optimized systematically. ISM is Rieter's individual spindle monitoring system featuring precise data collection on the ring spinning machine.

### OPTIMIZING OUTPUT AND QUALITY

ISM is based on optical scanning of the ring traveler. If the traveler is no longer rotating on the spinning ring, the control unit detects an end down and indicates this by illuminating the spindle LED on the spinning position itself. Continuous monitoring also enables slipper spindles to be precisely identified and indicated.

### USING ISM FOR EFFICIENT PERSONNEL DEPLOYMENT

The three-level light guidance system leads personnel directly to problem spindles by means of signal lamps.

#### 1ST LEVEL: MACHINE

Two signal lamps on the headstock and tailstock of the machine indicate from a distance a ring spinning machine on which the ends down threshold has been exceeded.

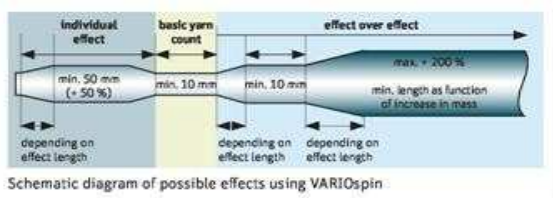
#### 2ND LEVEL: SECTION

A high-intensity LED on each side of the section (24 spindles) indicates the section in which the end down or slipper spindle has been detected.

#### 3RD LEVEL: SPINDLE

This level indicates the spindle at which an end down has occurred or which is operating outside the required tolerances. The malfunction can be identified precisely here on the basis of the illuminated signal shown by the spindle LED.

The three-level light guidance system enables the distance covered by operating personnel to be reduced by up to 40%.



## FANCY YARN SYSTEM

### VARIOspin

The integrated VARIOspin fancy yarn system enables fashionable effects to be produced economically. With this system spinning mills can respond flexibly to very different customer and market needs and produce various structured effects in ring-spun and Com4@vario yarns.

VARIOspin is available as an option and is integrated in the machine and the control system ex works. No complicated or costly retrofits are necessary. Switching between fancy yarn and standard yarn is performed easily and quickly at the operator panel via the machine control system.

## VARIOSPINDATA

VARIOspinDATA programming software is used for creation, input and management of fancy yarn data and provides the basis for data conversion and transfer between PC and machine control system. The fancy yarn data are transferred via an RS 232, Ethernet or USB interface.

## TWO-COMPONENT YARN SYSTEM

### Core Yarn System

Elastic yarns are becoming increasingly popular – mainly in the underwear and foundation garment sectors, swimwear, hosiery and sportswear. The outstanding quality characteristics of Rieter core-spun yarns enable them to be used in many items of ladies' and men's outerwear as well as in leisurewear.

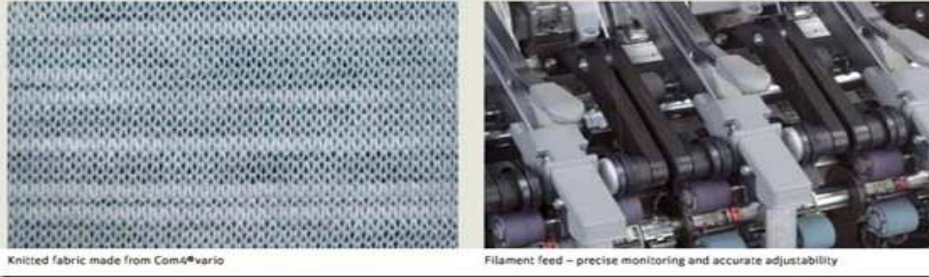
Besides improved wear properties and comfort, better shape retention and crease resistance as well as a reduced tendency to bagginess are quality features that are positively influenced.

### QUALITY AND PROCESS CONTROL

Precision adjustment of core yarn guidance and a constant flow of filament (elastomer) to the fiber bundle are the precondition for faultless integration in the yarn. This is ensured by a supplementary roving guide in the break draft zone of the ring spinning machine.

On the ComforSpin machine precise guidance of the roving is guaranteed by the compacting zone.

The roving stop motion interrupts roving feed immediately in the event of a filament break. This prevents yarn from being produced without filament. Lap formation on the top delivery rollers or the bottom delivery cylinder is also prevented.



Knitted fabric made from Com4®vario

Filament feed – precise monitoring and accurate adjustability

Top: Ri-Q-Cot top roller cover

Center: Ri-Q-Tubes high-quality spinning tubes

Bottom: Rieter traveling cleaner on a ring spinning machine

## RIETER TECHNOLOGY COMPONENTS

Ri-Q-Cots / Ri-Q-Tubes / Traveling cleaner

### RI-Q-COTS

The Ri-Q-Cot top roller cover developed by Rieter for Rieter ring spinning machines ensures faultless yarn production with high quality. Various Ri-Q-Cot top roller covers are available to meet different requirements.

The specification of Ri-Q-Cot top roller covers is based on many years of experience in very diverse applications in spinning mill operations.

### RI-Q-TUBES

Rieter has developed spinning tubes under the name of Ri-Q-Tubes together with Sonoco, the well-known manufacturer of yarn carriers. These tubes guarantee precision and long service life to meet the highest technical and technological requirements in the spinning process.

Ri-Q-Tubes high-quality spinning tubes have been designed specifically for Rieter ring spinning machines. With their special plastic composition and dimensional stability they are specifically designed for high spindle speeds, high concentricity and long service life in conjunction with minimum loading of the spindle bearing.

### RIETER TRAVELING CLEANER

The Rieter traveling cleaner rounds off the offering in Rieter's product range. Together with the transport system for roving bobbins, all components are now available from a single source. The traveling cleaner is an integral component of installation planning for all creeling versions – with and without roving bobbin transport system.

The Rieter traveling cleaner systematically prevents accumulations of fibers and thus helps to keep roving frames and ring spinning machines clean.