SEMITRONIK

'AUTOCONO'
MULTI-CHANNEL PRE-SET
YARN LENGTH
MONITORING AND CONTROLLING SYSTEM

'AUTOCONO' MULTI-CHANNEL PRE-SET YARN LENGTH MONITORING AND CONTROLLING SYSTEM

FOR

- **RING SPINNING FRAMES**
- **OPEN-END SPINNING FRAMES**
- **DRAWING FRAMES**
- **AUTOMATIC WINDERS**
- **ASSEMBLY WINDERS**
- **TWISTERS**
- **TEXTURISING MACHINES**
- **CRIMPING MACHINES**
- **DRAW TWISTERS**

WITH
DATA MANAGEMENT SOFTWARE PACKAGE

WHICH WILL RESULT INTO :

- Reduced end brakes even at high speed
- Lower doff time
- Higher utilization with continuous monitoring of each spindle for
  - Optimized patrolling
  - Reduce walking distance
  - Easy identification of stop spindles
  - Improved quality cops and discarding bad quality cops and weaker yarn from rogue spindle and slip spindles respectively.

The features are :

- Length measurement per spindle
- Length switch-off per spindle
- Efficiency per shift or batch start
- Running times
- Downtimes
- Recognition of thread breakage or operator stop
- Monitoring of spindle speeds
- Control of winding speed
- Access levels for operator, foreman, administrator
- Retro-fittable for older machines series

The present high cost of textile machinery, particularly of the most sophisticated and automatic kind, requires rapid automisation for optimum use of the production capacities.

The system which controls machines running by collecting and processing data in real time - offers many advantages regarding production, quality and manufacturing costs.

This is achieved for spinning machines with the 'AUTOCONO' Multi-Channel Pre-Set Yarn Length Monitoring and Controlling System by counting the revolutions of RPM of main motor and corresponding length of the yarn per minute being wound. This data is utilized to measure the length of the yarn to have pre-set length for each spindle.

The control box monitors the presence of the yarn on each spindle through a sensor. (yarn break detector sensor)

A chain of inter-connected cables to connect the control boxes with indication boxes with indication module.

The system is with scanning display to indicate spindle no. & corresponding length accumulated and pre-set length.

When the drawn length for any spindle equals the pre-set length for that spindle, corresponding relay in the control box activates for operation of :

i. The cutter :
   To cut the yarn which disengages it from accumulating any further.
   OR
ii. Lamp :
   Just lights up an indication lamp so that operator can do the rest of the job.
   OR
iii. Doffing device

The cumulative drawn length for that spindle is automatically zero after doffing, engaged with the each drum.

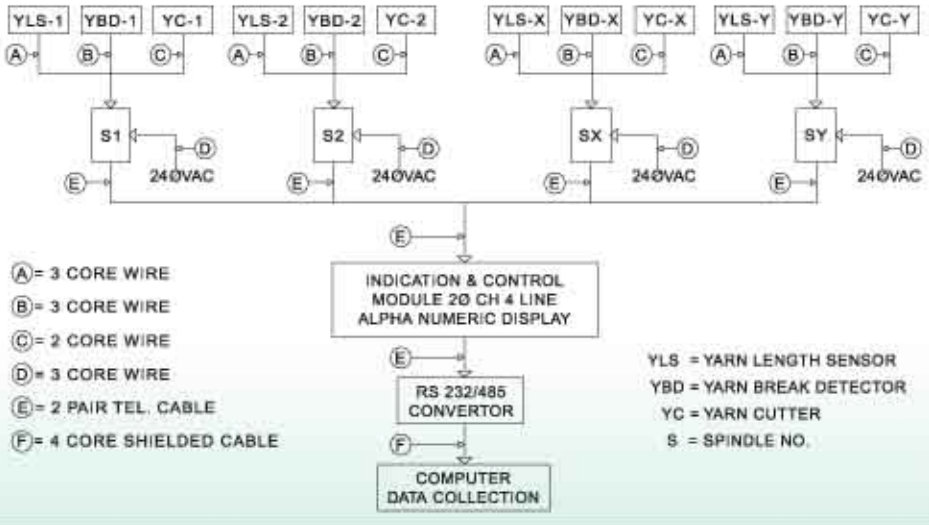
The memory of the micro-controller unit is fully battery backed-up to ensure against data loss. Thus the set lengths for all the zones and the cumulative drawn length for each spindle is retained in case of a power failure or if the machine is stopped.

The led indication starts flashing as soon as any spindle attains the set length and same will stop flashing when re-started.

It meets two different integrated requirements simultaneously :

- It supplies detailed information concerning the running of the machine immediately and simply on the spot. i.e., defects in the production process either with machine or material i.e. quality of the yarn will be corrected by intervening in real time.
- The system indicates drop in efficiency and production, number of stops etc. on computer so that adjustment optimization can be immediately verified.
- Because of constantly updated machine data, work assignment and optimization can be done.

BLOCK DIAGRAM OF MULTI-CHANNEL PRE-SET YARN LENGTH INDICATOR AND CONTROLLER FOR WINDING MACHINE/TWO FOR ONE TWISTER/TEXTURISING MACHINES



OBJECTIVE EVALUATION OF THE PRODUCT QUALITY BY

Knowing exactly, for each lot, the number of knots per kg. etc.

SAVING OF TIME AND PEOPLE IN PRODUCTION CONTROL

With immediate, automatic and reliable data available.

CLARITY IN DETERMINING PRODUCTION COSTS

Due to the rapid availability of all the elements for the analysis of data regarding production and efficiency.

The unit displays the data processed in real time.

Thus, information can be immediately analysed on the spot.

For a permanent record, information can be obtained on computer.

SPECIFICATIONS

The system consists of the following :

- Micro-controller unit one per spindle.
- Indication module :
  To display :
  - RPM/speed mtrs./min. or yard/min.
  - Spindle no. : 3 digit.
  - Set value : 6 digit.
  - No. of breakage for each spindle.
  - Actual value : 6 digit.
  - No. of doff. : 2 digit.
  - Run time.
  - Individual spindle efficiency.
- Feather touch keyboard to enable length setting and other data on display.
- Lock to store the memories of length setting.
- 2 proximity sensors - one each side of the machine to sense the RPM of drum shaft or for motor driving the individual spindle.
- A yarn break detector used as sensor to detect the presence of the yarn on spindle.
- Cutter for automatic doffing.
- Serial interface with computer.

The pre-set length for each spindle can be set through computer or indication module. The set length can be stored in memory by means of lock to avoid any tampering of the same.

THE ADVANTAGE OF THE SYSTEM

If, for a particular warping lot, specific yarn length is required. If the cones made on a winding machine installed with system under reference, (Autocono) the amount of remaining yarn wastage in the creel is on average around 1% of the amount of yarn wrapped, while wastage at warping with the cone made on winding machine with control system based on diameter stop motion system, is around 3 to 4%.

Thus the use of length measuring system packages is of great economic advantage not only in beaming and warping but also in two for one twister.

For the yarn spinner, sales point of view, the systems packages have an additional quality features due to the measured length.

Apart from the system with the length measuring, system produces packages with a pre-determined length of the yarn, system is with the data collection.

This system ensures constant monitoring of all winding heads and which gives information about the up-to-date machine condition and production.

The production data during a particular shift, up-to-date information can be called-up at any time in the form of an intermediate print-out on computer.

As each spindle is checked every 2 seconds, a high degree of accuracy of the data is ensured.

It can be immediately determined on the machine whether the pre-determined efficiency is being achieved, whether the electronic yarn clearer has a particularly high malfunction rate.

THE IMPORTANT DATA IN THE SHIFT REPORT

- Efficiency % per spindle.
- Running time in minutes.
- Number of yarn break cuts per spindle/machine.
- Number of yarn joints per spindle/machine.
- Total number of cycles/doffs.
- Total and individual stoppage time for spindle per shift/day.
- Length of the yarn on each cone.
- Total production.

FEATURES

- Can be adapted to any textile machine requiring measurement of yarn length such as winding machine, two-for-one twister, assembly winder, draw twister, texturising, crimping machines, etc.
- Auto stop is possible according to the established length.
- Length setting for each individual spindle.
- Facility to find out the length of yarn accumulated on any spindle at any time.
- Since one controller can control one drum, operation is simple and confirmation is easy.
- Simple operation ensures uniform package.
- In order to avoid unwanted operations, the keyboard can be put out of use by means of a key.
- Special training of personnel is not required.
- Yarn detector is with provision to monitor yarn strain, variation in colour, contamination, tension, etc.

The display presents the constantly updated data regarding the efficiency and production of the machines.

OPERATING EFFICIENCY

A continuous display of actual and targeted efficiency from the running performance of the yarn.

If breakage rate increases the targeted efficiency is correspondingly lowered.

The operating efficiency figure is an ideal basis for a wage incentive scheme and eliminates all the problems associated with such schemes.

YARN CUTTER

YARN BREAK DETECTOR

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SPEED CONTROL

The machine speed can be controlled according to any desired factor. For example, the operative load could be kept constant inspite of varying breakage rates, or the machine speed could be controlled so that it was running as fast as possible without exceeding a certain breakage rate.

PACKAGE LENGTH MEASUREMENT

Winding on spindles can be controlled so that the spindle is stopped when a pre-set length is reached.

The system is available for texturising machine to have any required pre-set length of the yarn on any spindles.

DATA TRANSMISSION

Shift data can be transmitted to the computer if required, in addition to the local display.

In the case of automatic winders and open-end spinning frames, a single processing unit controls a machine and watches over the running of each spindle.

STOPPED SPINDLES

These are shown by LED which are on. One LED is for each spindle. When there is no yarn in the spindle then the corresponding LED is flashing. This makes it simple to see the current stage of the machine at a glance, and when an operator is looking after several machines, it eliminates unnecessary patrolling.

MODELS AVAILABLE

MODEL LMS-503/1

For winding machine equipped with yarn clearer [with yarn break detector and cutter which is to be utilized to monitor absence of the yarn when yarn breaks and to carry out operation of auto doffing on completion of required pre-set length] system supply is inclusive of cable required for connections.

MODEL LMS-503/2

For winding machine equipped with electrically operated doffing device for auto doffing:

System is with:

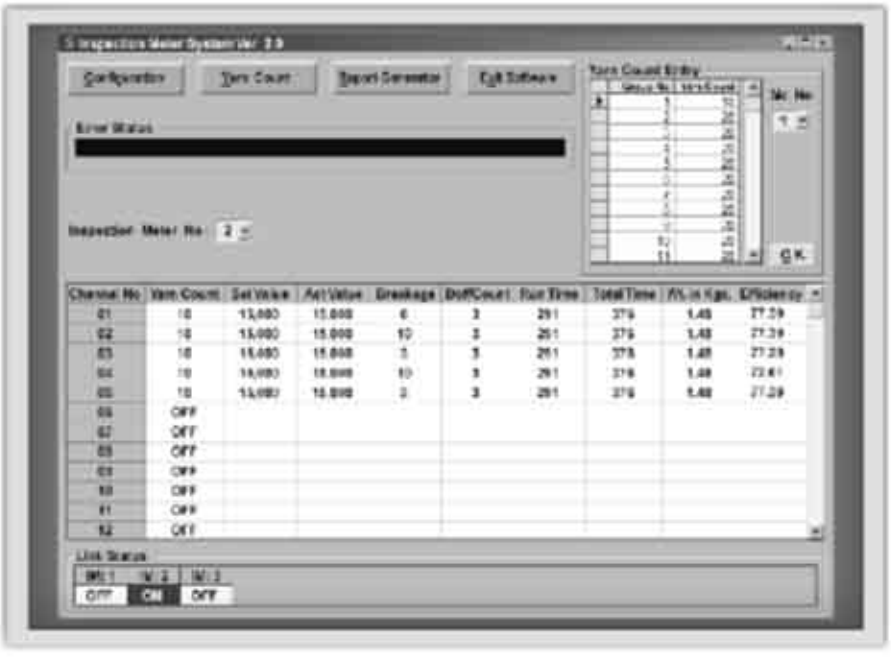
- Yarn break detector for each spindle.
- Power supply for yarn break detectors.
- Cable for connections.

MODEL LMS-503/3

For winding machine equipped with electrically operated yarn break detector to signal the yarn break on each spindle:

System is with:

- Yarn cutter (for auto doffing) for each spindle.
- Power supply for yarn cutters.
- Cable for connections.



MODEL LMS-503/4

With:

- Yarn break detector for each spindle.
- Yarn cutter (for auto doffing) for each spindle.
- Power supply for yarn break detectors & cutters.
- Cable for connections.

MODEL LMS-503T

For texturising machine.

MODEL LMS-504

For two-for-one twister machine with :

- Yarn break detector - 2 nos.
- Yarn cutter (for auto doffing) with facility to cut the other yarn in case, one of the two yarns break.
- Cable for connections.
- Power supply for yarn break detector & cutter.

MODEL LMS-502

For winding machine with each spindle driven by individual motor:

System consists of :

- Indication and control module.
- Non-contact type yarn break detector.
- Power supply for yarn break detector.
- Cable for connections.
- Interface module RS 232 to RS 485 converter with software package for 32 nos. winding machines (each winding machine with 60 spindle).

ADDITIONAL ITEM

- Indication module.
- Computer interface module.
- Software package for management information.
- Yarn cutter.
- Yarn break detector.

Yarn break detector also available with facility to monitor:

- Presence of yarn.
- Unevenness. i.e. thin and thick places.
- Yarn clearer application.
- Uneven diameter/count/denier variation.
- Colour variation.

For further details, contact

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Since our policy is of continuous development and improvement, we reserve the right to supply product which may differ from those illustrated & described in this publication.

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