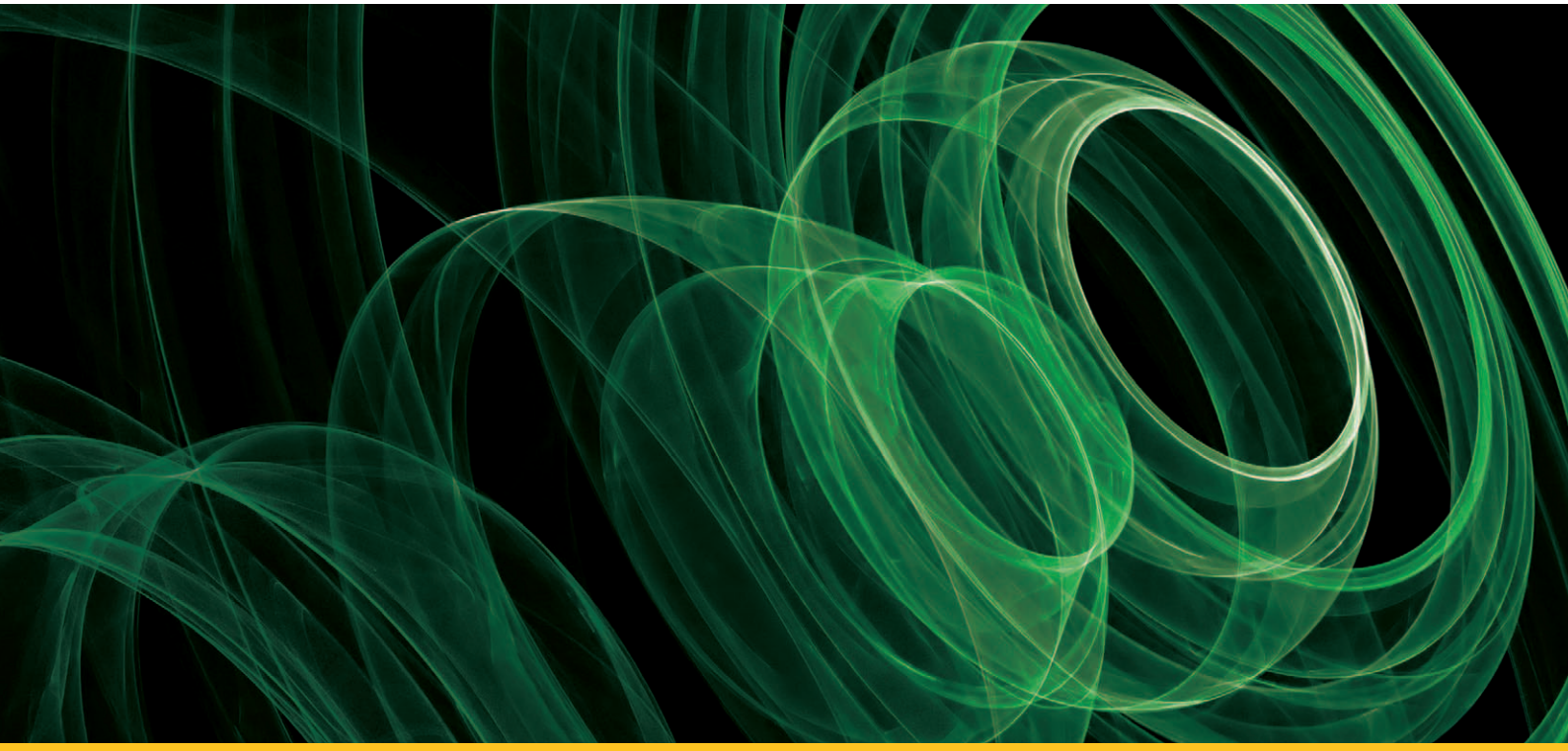
Loepfe



YARN*MASTER*® 3N1

Instruction Manual
Rieter R40

46374003en

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Table of Contents

Safety Instructions

Norms and Regulations

The LOEPFE YarnMaster® 3N1 yarn clearing system is a product which has been inspected for technical safety. It complies with the following directives:

2006 / 42 / EC	Machinery Directive
2006 / 95 / EC	Low Voltage Directive
2004 / 108 / EC	Electromagnetic Compatibility

Instruction Manual

To prevent faults and operating errors, we recommend to carefully read this Instruction Manual and to carefully follow the instructions given.

Indicates warnings which, if not properly observed, could harm your health, impair the functioning of the equipment or the security of your data.

Note: *The screen representations in this manual serve as illustration only. They should not be used as setting examples!*

A copy of this Instruction Manual must be kept easily accessible near the machine.

Liability

The manufacturer assumes no liability for damage caused by:

- Noncompliance with the safety, operating and maintenance instructions contained in this Manual.
- The use of spare parts/non-OEM parts/conversion parts not supplied by us.
- Unauthorized conversion and modification of the yarn clearer.
- Normal wear.

Operational Notes

This yarn clearing equipment may only be installed, initiated and operated by trained personnel.
Improper operation of the equipment could cause hazards.

In accordance with 2006 / 42 / EC, 2006 / 95 / EC, 2004 / 108 / EC. Do not open any covers (cooling, fire protection, contamination, spark interference etc.)

Do not open any sensing head.

Electronic components and assemblies (printed circuit boards) are endangered by electrostatic charges! Beware of touching the soldered connectors, pin contacts before they have been discharged statically. Hold the units at the periphery only.

Yarn Clearing (General)

Definition of Yarn Faults

The Open End spinning process supplies a relatively uniform yarn. However, differences in yarn diameter cannot be completely avoided. Thus, it is first necessary to distinguish between normal yarn irregularities and actual yarn faults.

Yarn faults may be defined as yarn irregularities which can lead to difficulties in subsequent production stages or to faults in the end product. Yarn clearing is defined as the detection and elimination of yarn faults. This task is performed during the spinning process. Yarn clearer are, therefore, part of a Open End spinning machine.

To eliminate a fault it is necessary to interrupt the spinning process. The rotor must be stopped, the defect removed from the package and a new piecing cycle must be initiated. Obviously this interruption results in a loss of production. Yarn clearing is, therefore, always a compromise between quality and production, i.e. between the maximum possible number of yarn faults which could be removed and the least acceptable production loss. This compromise results in a distinction between:

- **Acceptable yarn faults**, namely those which are tolerated for sake of machine efficiency, and
- **Unacceptable yarn faults** (faults that cannot be tolerated)

Yarn Faults

Based on the average yarn diameter (basic diameter), the following yarn faults can be detected and cleared:

- **Thick** and **thin places** are defined, depending on whether there is an increase or a decrease in diameter.

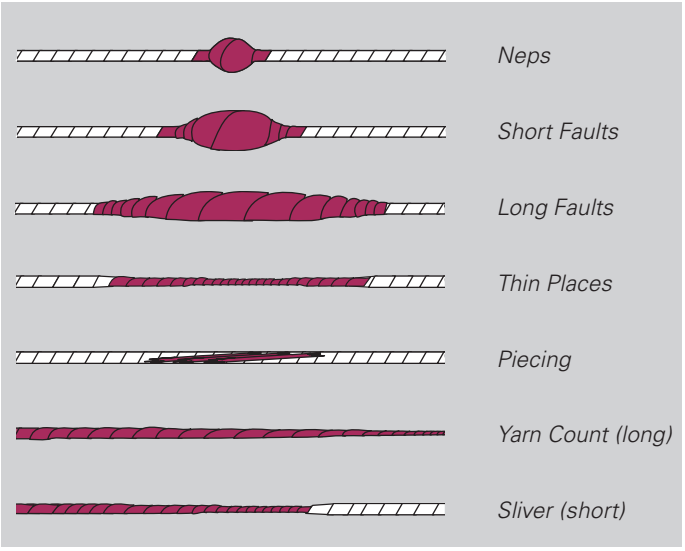
  Within the thick places further distinctions are made:

– **Neps**, as extremely short (up to a few mm) and extremely thick faults (several times the base diameter)

- **Faulty piecing**

  Within the count deviation further distinctions are made

- **Thin and thick sliver** (short length)
- **Thin and thick count** (long length)



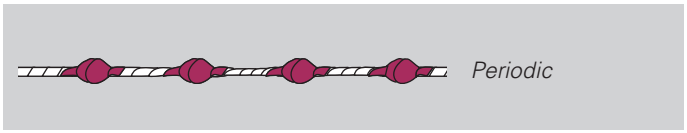
Accumulations of Faults (Moiré)

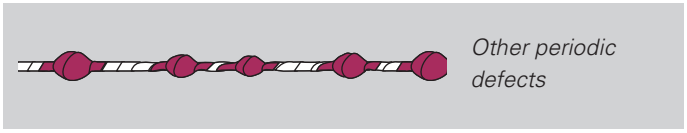
- Periodic defects (moiré)

Periodic defect where the period is related to the rotor diameter of the OE rotor. They can be caused by contaminated or used rotor

- Other periodic defects

They can be caused by defects or wear from components of the spinbox. These defects are detected by the spectrogram analysis.

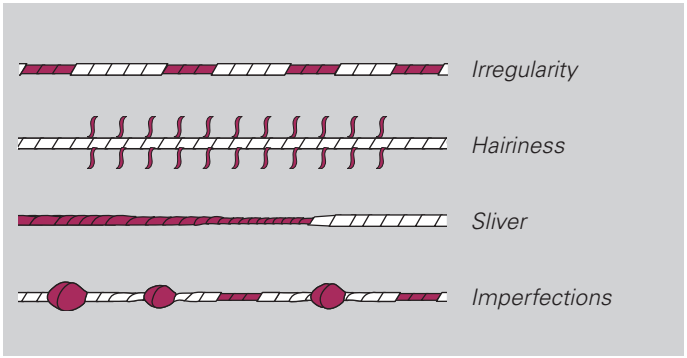




Yarn Irregularities (CV)

Disturbing diameter variations or sporadic irregularities, for example:

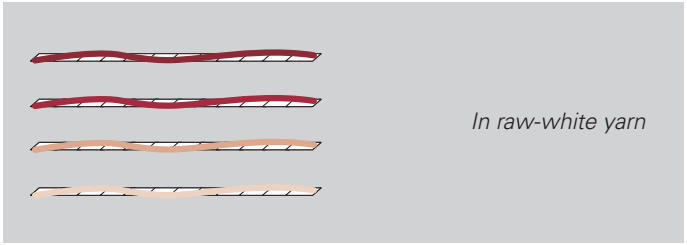
- Variation of yarn (CVy)
- Variation of hairiness (CVh)
- Variation of sliver (CVs)
- Imperfections (IPI)



Foreign Matter (F)

Foreign matter with a color that is different from the base color of the yarn:

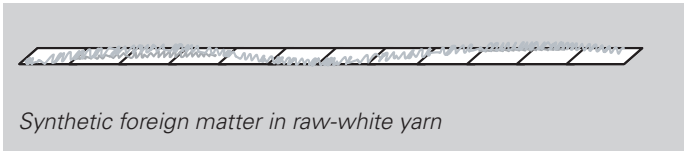
- Dark foreign matter in the raw yarn



Synthetic Foreign Matter (P)

Synthetic foreign matter (e.g. polypropylene)

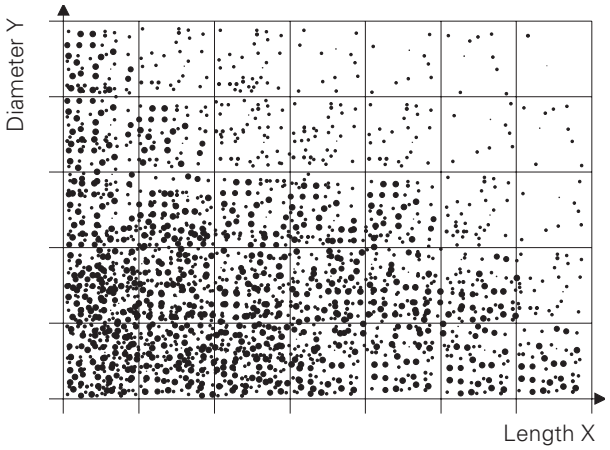
- Irrespective of the color of the yarn and the foreign matter, for example, white and transparent polypropylene in raw-white yarn



Yarn Fault Classification

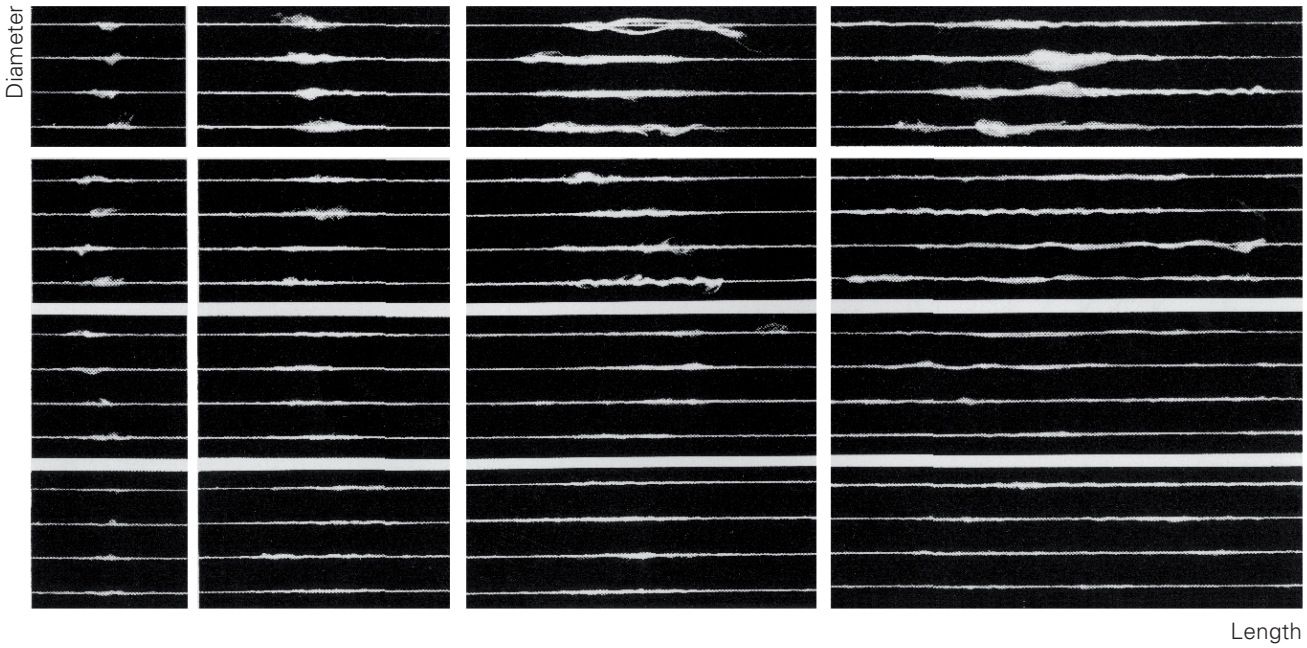
Yarn faults are defined in terms of a transverse dimension and a longitudinal dimension. The transverse dimension is expressed as a deviation of normal diameter and the longitudinal dimension in millimeters.
The definition of yarn faults in terms of length and thickness suggests the representation of yarn faults in a Cartesian system of coordinates. Thereby the length is plotted in the horizontal direction (X-axis), and the thickness in the vertical direction (Y-axis). Each yarn fault can, thus, be plotted as a point in the plane of the coordinates. Furthermore, the plane of the coordinates can be divided into individual fields (classes) in order to summarize (classify) similar yarn irregularities into groups and to count them. This takes into account another extremely important point of view, namely the frequency of similar faults (see figure 1).

Figure 1



Frequency distribution of yarn faults in the coordinate grid

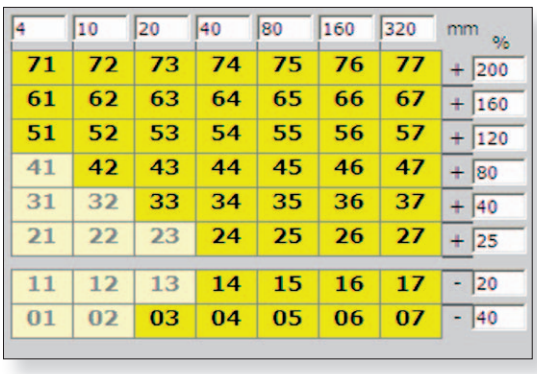
Figure 2



The choice of the class limits is largely random. Diameter faults are most frequently divided into different thickness and length classes (see figure 2).

The YarnMaster System 3N1 uses the following default classification (see figure 3).

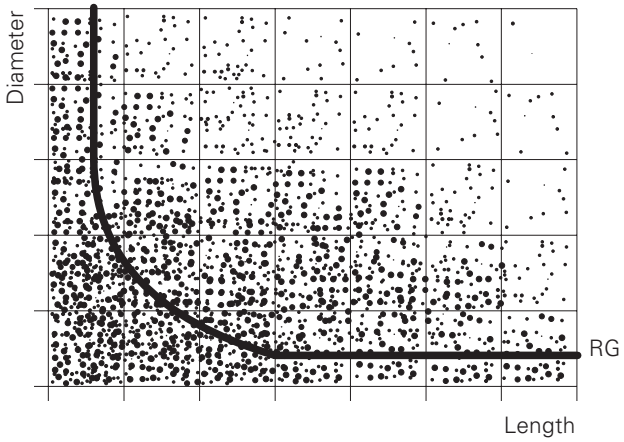
Figure 3



Yarn Clearing

Base Curve

Figure 4



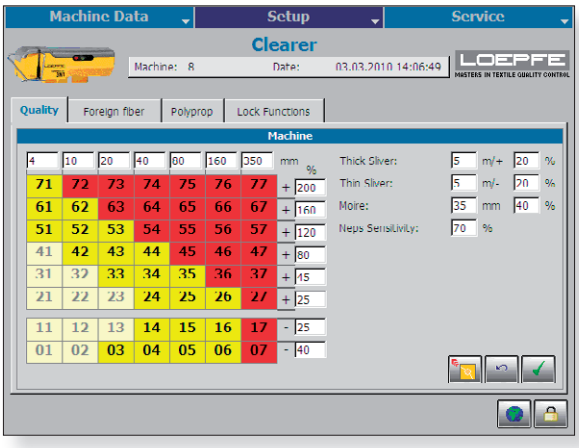
The distinction between yarn faults which are to be cut out and those which are to be left in the yarn (unacceptable and acceptable yarn faults), which is made in the interest of Open End spinning efficiency, has already been pointed out. This distinction can be represented graphically on the plane of coordinates as a line which separates the acceptable faults (below) from the unacceptable ones (above). This line represents the **theoretically-desirable base curve (RG)**. A concave base curve (see figure 4) normally corresponds to the requirements in practice.

The concave shape arises from the textile evaluation, whereby the greater the deviation in diameter that is tolerated, the smaller the length deviation that appears acceptable. Furthermore, the base curve, thus, passes through fields of similar fault frequencies, which meets the requirement of high efficiency.

A distinction must be made between the theoretically-desirable base curve and the **practically-achievable quality settings**, which depends on the one hand on the clearing characteristic typical of a clearer type, and, on the other hand, on its setting flexibility.

Clearer Characteristics

Matrix Clearing



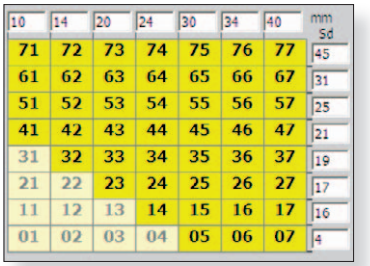
Each time the detector sees a single diameter measurement that deviates for more than +25% or -20% from the reference mean value (this is the noise region of normal yarn irregularity!), this measurement is considered as the possible beginning of a yarn defect. Subsequent diameter samples are kept in memory until the yarn diameter is again between the noise region around the reference mean. At this time, the average defect diameter deviation and the defect length are calculated. One defect is then added to the count in the appropriate field of the 8x8 matrix, first column is not shown (contains NEPS). This classification matrix divides all defects into 8 diameter classes (2 for thin places; 6 for thick places) and 7 length classes The class limits can be set freely by the user.

Piecings

Clearing according to the settings of the quality matrix allows for the creation of a optional piecing defect detection (depending on type of machine).

Foreign Matter (F)

The human eye is determining color differences by detecting differences in light absorption. The sensor for foreign matter incorporated in 3N1 is measuring these differences in light absorption to detect foreign matters in the yarn in a most effective way. Foreign matters are classified in a 7x8 matrix.

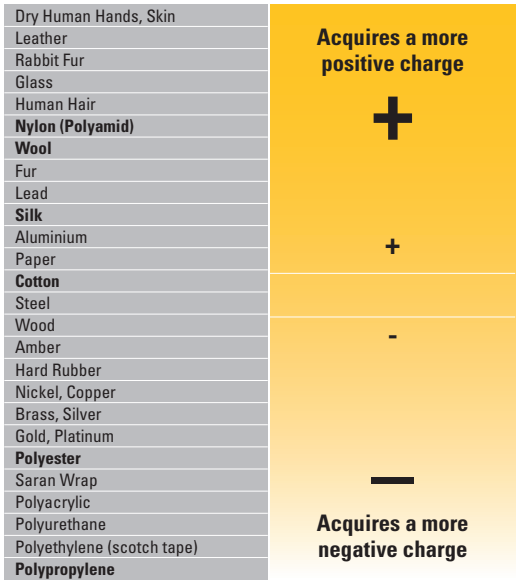


Synthetic Foreign Matter (P)

The detection of synthetic foreign matter as polypropylene, polyamide (nylon) etc. is based on triboelectricity. The different electrical charging of materials (e.g. cotton and polypropylene) caused by travelling of the yarn over a detection element. The settings and classification can be displayed in a 7x8 matrix.

Triboelectric Effect

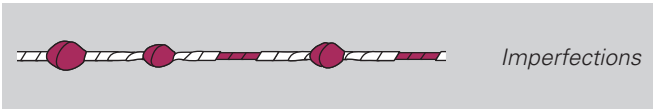
The triboelectric effect is an electrical phenomenon where certain materials become electrically charged after coming into contact with another different material. The polarity and strength of the charges produced differ according to material and surface smoothness. That means: The further the materials lie off each other in the series, the more definitely they can be detected.



Triboelectric Series

Imperfections

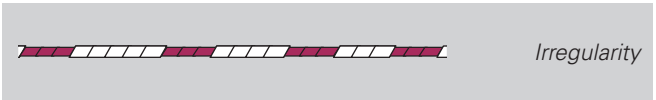
Frequent yarn faults are described as Imperfections in the language of the textile industry. It is generally acknowledged that the shorter the fault length, or the smaller the diameter deviation respectively, the more frequent the event.
The source of these faults is found in the raw material or in a non-perfect spinning process. The raw material, card wires, opening rollers, rotor, nozzle have a significant influence on the imperfections.
With a reliable analysis of the Imperfections it is not only possible to optimize the production process but also conclusions can be drawn concerning the quality of the used fibre material.



Imperfections

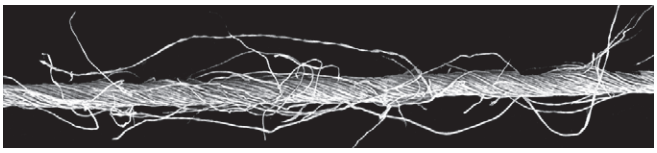
Yarn Irregularities

The monitoring and evaluation of the surface structure of a yarn (e.g. hairiness), is a further important criterion for quality assurance. In order to predict yarn behavior during processing in weaving or knitting, it is not sufficient to simply consider individual quality characteristics (e.g. yarn irregularity) to assess a yarn. Only a combination of different quality criteria (e.g. hairiness and irregularity) supports making a definite conclusion.



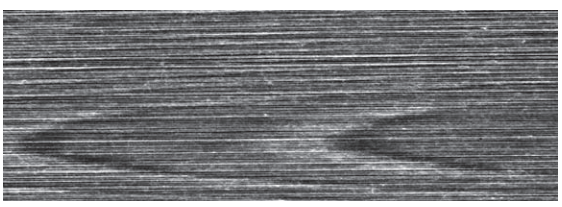
Irregularity

Hairiness



Moiré

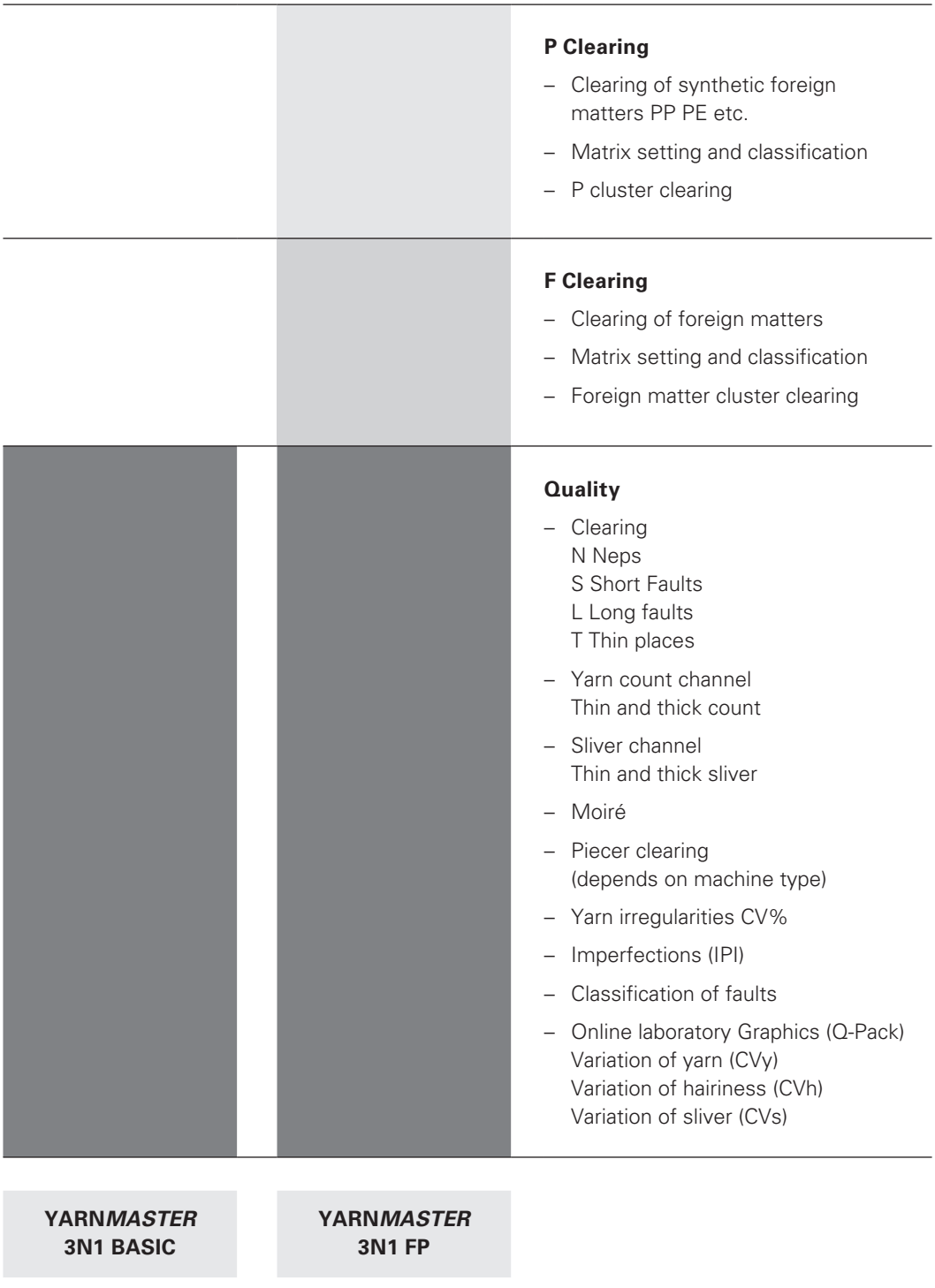
Moiré is a repetitive yarn defect caused by point contamination of the rotor's internal groove. Such contamination of the rotor produces thick places in the yarn with a distance to each other equal the rotor circumference.



Moiré

YarnMaster 3N1

Functional Range



Operating

Central Unit SCU

A Touch Screen

The central unit is operated by direct inputs on the touch screen. Applying light pressure on the screen surface activates the functions shown.
Tap the menu item to be selected with the finger
Do not use a pointed, metallic object as this could damage the monitor surface!
Cleaning:
The monitor surface is made of plastic material. Clean the monitor with a soft cloth. Heavy soiling can be cleaned with a cloth moistened with a water and soap solution.

B USB Port

USB port to transfer reports and clearer data to a server and printer. The USB port is protected against dust and humidity by a removable cover.

User Interface

1 Menu Bar (Overview Tabs)

Tapping the tabs in the header calls up the respective menus.

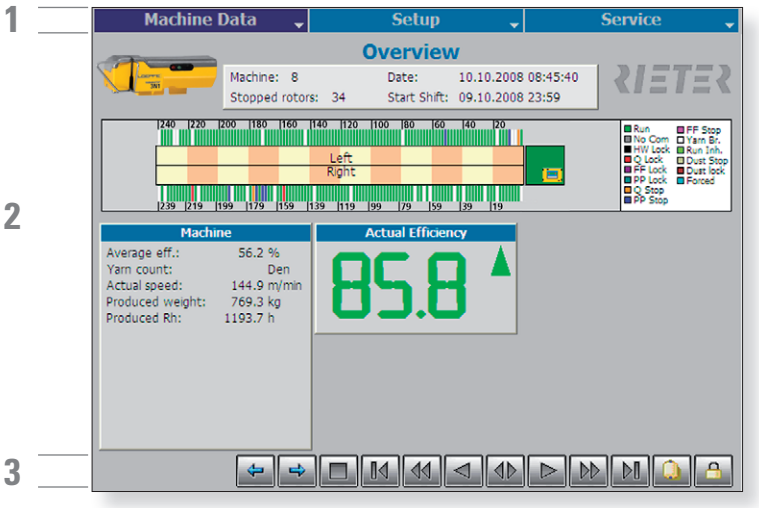
Machine Data: Shows all important data
Setup: Used for all kind of settings
Service: Used partly for one-time base settings and for service applications

2 Overview Page

Shows all data on a selected page. Depending on the page displayed, the settings can be entered or an overview of the data is possible.

3 Navigation Bar

Navigation buttons:
Enter a rotor number to display the rotors' related data.



3 Navigation

Pages can contain following buttons:

 Next/previous page/list.
Select next/previous option/value.

 Enter rotor number.

 First/last rotor of the selected machine side.

 First/last rotor of the selected section.

 Previous/next rotor. Keep touched for fast scrolling.

 Switch machine side.

 Deselect rotor.

 Refresh the shown data.
To remove this button from or to add it to each page: **Setup > User Interface > General.**

 Change the user interface language.
To remove this button from or to add it to each page: **Setup > User Interface > Languages.**

 Lock/unlock data entry with a password.
To remove this button from or to add it to each page: **Setup > User Interface > Passwords.**

 Unlock technical alarm

 Unlock hardware

 Unlock rotor

 Warm restart

 Cold restart / reboot the SCU

 Touch the cleaning button before cleaning the touch screen.
To remove this button from or to add it to each page: **Setup > User Interface > General.**

 Sort the list.

 Scroll the list.

 Replace the settings by the default settings. Touch  to apply the default settings.

 Undo changes.

 Cancel the changes.

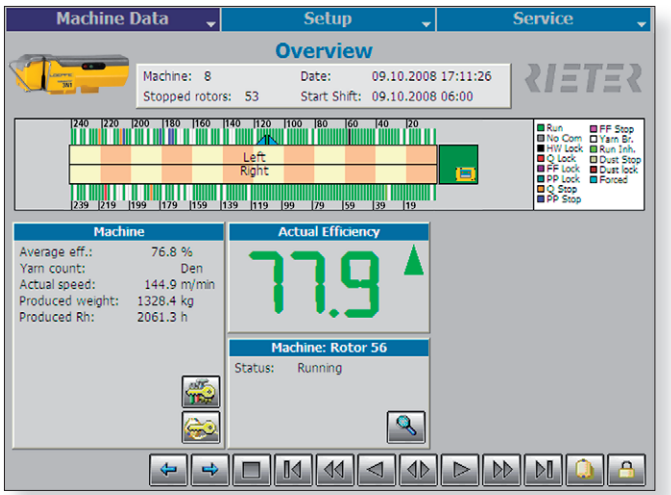
 Save the entered data (all changes need to be confirmed).

 Clear list/report.

Additional buttons are explained per page.

Important short names for the manual, used in the manual

Q	=	Quality	SCU	=	Sensor control unit
F	=	Foreign matter	SE	=	Section electronic
P	=	Polypropylene	SH	=	Sensing head
UI	=	User interface			



Machine Overview

The header contains:

- Machine number/name
- Date and time
- Number of stopped rotors
- Shift start date and time

The machine block shows you the state of each particular rotor (see caption below).

Information about the total efficiency and production data on both sides (regarding the machine type). For more information see chapter Machine Data / Status / Overview.

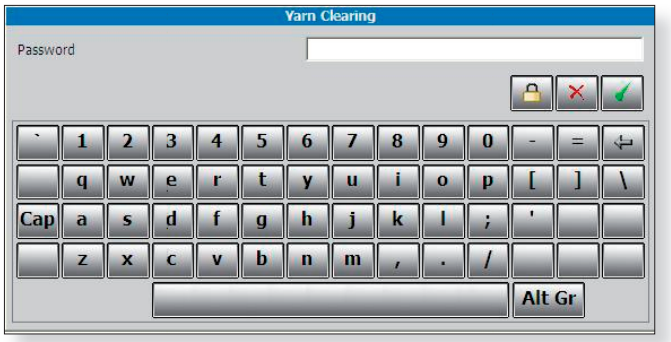
Note: Overview shows the data for the entire machine or for one side (left/right; depends on machine type).

Color	Status
Lime green	Running
Grey	No communication
Black	Hardware locks, forced lock
Red	Quality locks
Purple	Foreign matter locks
Teal	Polyprop. locks
Orange	Quality stops

Color	Status
Fuchsia	Foreign matter stops
Blue	Polyprop. stops
White	Yarn broken
Green yellow	Run + inhibit
Tan	Dust stops
Brown	Dust locks
Cyan	Forced stop

Rotor Status Color Codes

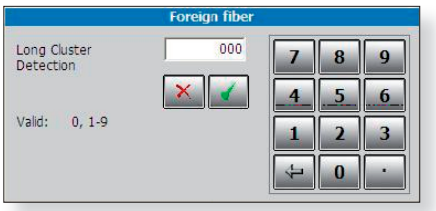
The Rotor status color gives the information about the condition of each rotor.



User Password

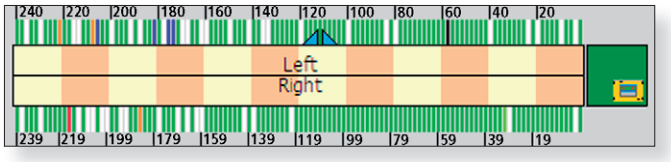
Default: 123
Enter the password and confirm.
Qualified personnel can touch the lock button and enter the service password.

Change to alternative characters with Cap button.



Data Entry

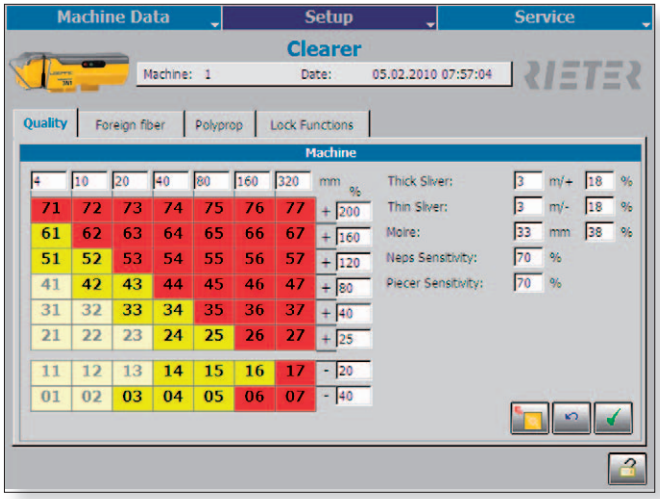
Data entry needs to be confirmed twice, once in the data entry window and once in the corresponding main window. The left side shows the selected parameter and the possible limits can be put in.



The indicator on the rotor side shows the selected rotor.

Settings Clearer Parameter / Start

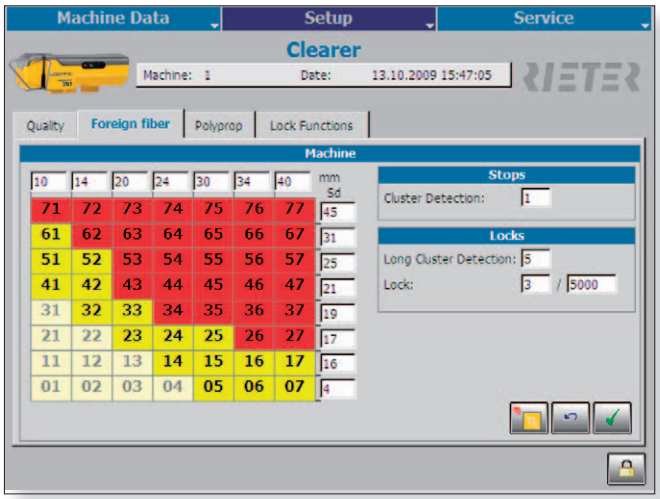
Enter the yarn clearing parameters by putting in the numbers in the length and the % deviation box. (Range for all settings see chapter Technical Data / Parameter Settings).
The matrix clearing can be selected or deselected by pressing the corresponding square. Red is selected for clearing and yellow for possible add on. The light yellow is not possible to be selected (disabled by system)



Yarn Quality (Q)

The X-Axis shows the subdivision of the length. It is possible to change this parameter.
The Y Axis shows the deviation (Sensibility). It is possible to change this parameter.

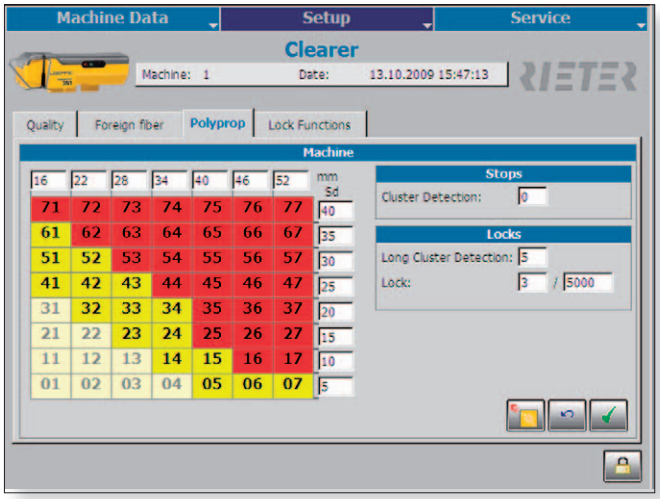
- Thin and thick sliver for detection of misplaced cans or partly decreasing/increasing of the sliver diameter
- Moire: Length of the fault depending on rotor diameter
- Neps sensitivity: length generally 5mm, deviation selectable
- Piecer sensitivity (depends on type of machine) deviation selectable (% of general clearing during piecing)



Foreign Matter (F)

The X-Axis shows the subdivision of the length. It is possible to change this parameter.
The Y Axis shows the intensity It is possible to change this parameter.

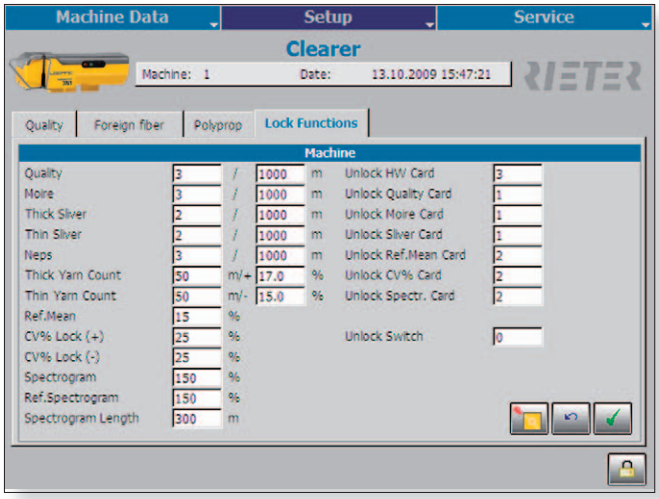
- Switch off the F clearing: set Lock to 0
- Cluster: sensitivity for short cluster (possible to remove during piecing)
- Long cluster: sensitivity for long cluster
  (Locks cannot be removed during piecing. They must be removed manually).
- Lock: stops in F within certain length
  (Locks cannot be removed during piecing. They must be removed manually).
- The setting 1 is the most sensitive



Polypropylene (P)

The X-Axis shows the subdivision of the length. It is possible to change this parameter.
The Y Axis shows the intensity It is possible to change this parameter.

- Switch off the P clearing: set Lock to 0
- Cluster: sensitivity for short cluster (possible to remove during piecing)
- Long cluster: sensitivity for long cluster
  (Locks cannot be removed during piecing. They must be removed manually).
- Lock: stops in P within certain length
  (Locks cannot be removed during piecing. They must be removed manually).
- The setting 1 is the most sensitive



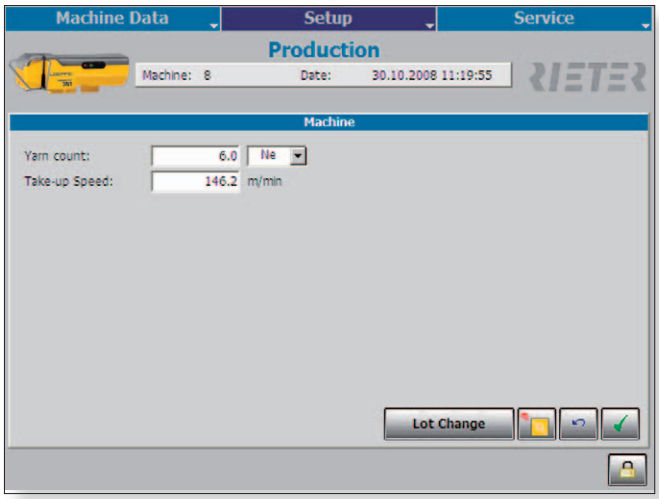
Lock Functions

Enter the yarn lock parameters by putting in the numbers. With this function it is possible to lock each rotor with giving parameters. Unlock is possible with the unlock card (corresponding type of card), with the button on sensing head or at the SCU.

- CV% Lock: relative deviation from the median machine CV%. Lock for particular rotor.
- Unlock switch: Button on sensing head

Unlock 1: unlock all locks with value 1 from the settings above
Unlock 2: unlock all locks with value 1 and 2 from the settings above

Enter 0 to disable a function.



Production, Lot Change

Enter the production data here.

Put in the yarn count and choose between Ne, Nm, tex, Nc. Take-up speed is set by the machine.

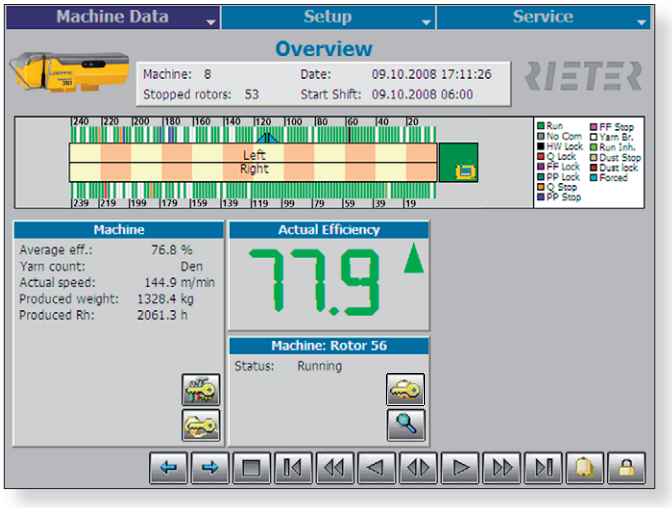
Attention: initiate a lot change:

- After changing yarn count
- After changing Lot
- After each change of spinning parameter on the machine
- After each change of take-up speed
- After interruption for more than 24 hours

– Production Settings can be saved on, and loaded from a USB stick. (see chapter *Checks and Maintenance/USB)*
– A Lot change forces a shift change

Machine Data

Status > Overview



The Overview is the base screen and shows all the important data.

The machine block shows the state of each particular rotor.

Information about the total efficiency and production data on both sides (Regarding the machine type) and major information as.

Efficiency:

: decreasing

: increasing

: Stable

The value is red, if the efficiency is below the target efficiency. This target efficiency can be set in Setup/User Interface/Overview

Production weight: of the machine (from shift start)

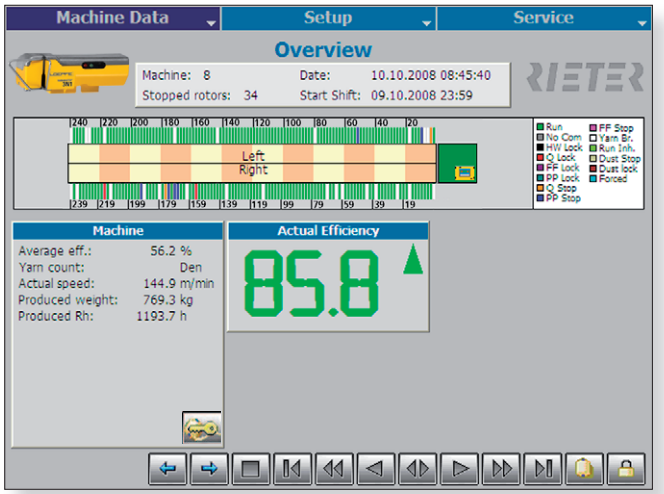
Produced Rh: Rotor hours of the machine (from shift start)

/ With next or rotor button you can navigate to particular Rotor.

With the stop button you just go back to the whole machine.

With the lens you can navigate to the production data of the selected rotor (as chapter Machine Data/Status/Clearer Data).

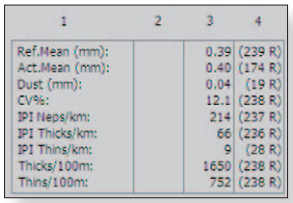
Status > Clearer Data

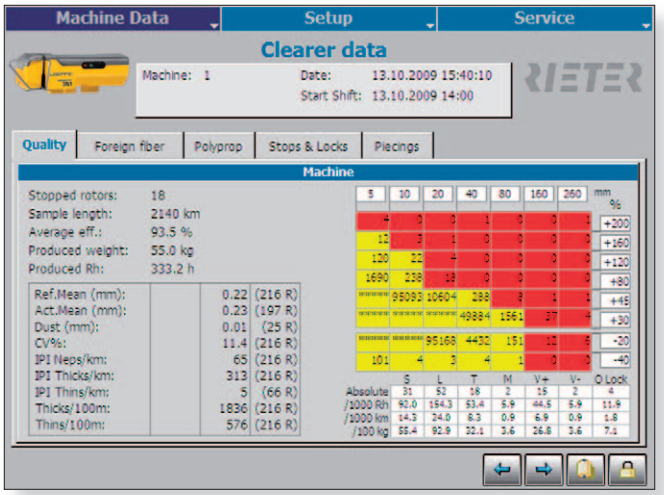


Note: The following production data are possible to see for the machine and for each rotor (more information in chapter *Checks and Maintenance/Index Data Explanation)*.

Chart on the left side (for all Clearer Data):

1. Column: Description
2. Chosen rotor
3. Mean value: Machine
4. Number of rotors for the corresponding mean calculation



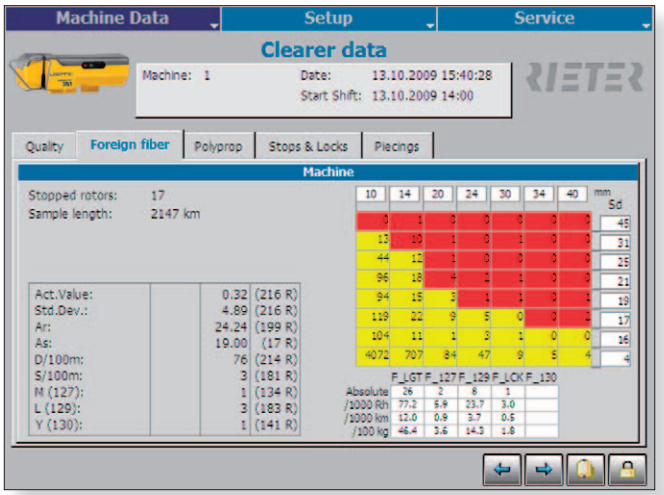


Quality > Machine

Stopped rotor: total stops
Sample length: since shift start
Average eff.: of the machine (from shift start)
Production weight: of the machine (from shift start)
Produced Rh: Rotor hours of the machine (from shift start)

Quality > Rotor

Sample Length: of the rotor
Efficiency of the rotor (starts from shift)
Status: current state of the rotor

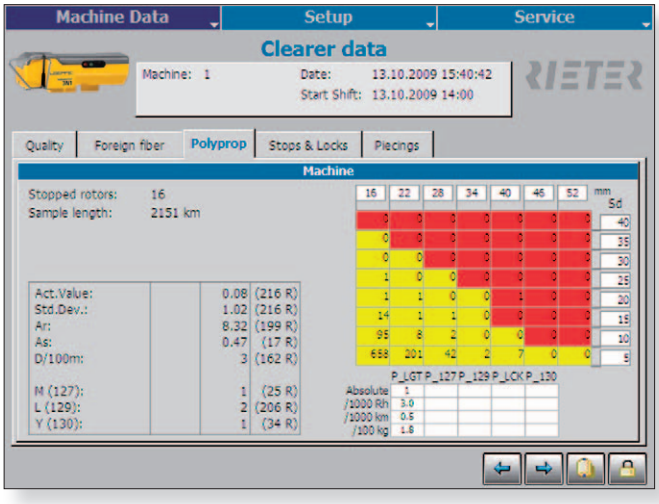


Foreign Matter > Machine

Stopped rotor: total all stops
Sample length: since shift start

Foreign Matter > Rotor

Sample length: of the rotor
Status: current state of the rotor

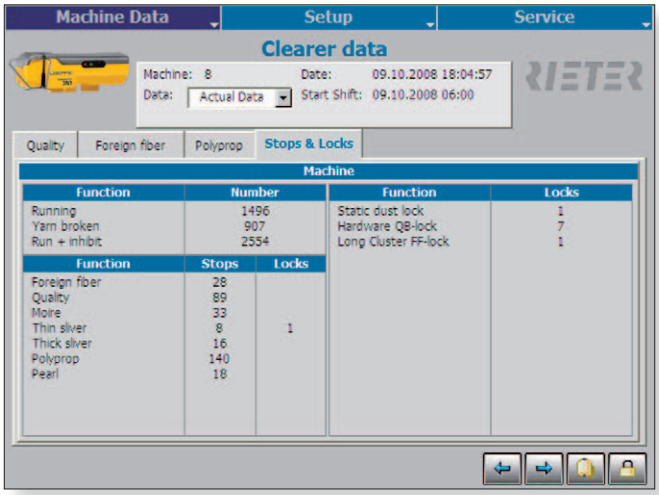


Polypropylene > Machine

Stopped rotor: total all stops
Sample length: since shift start

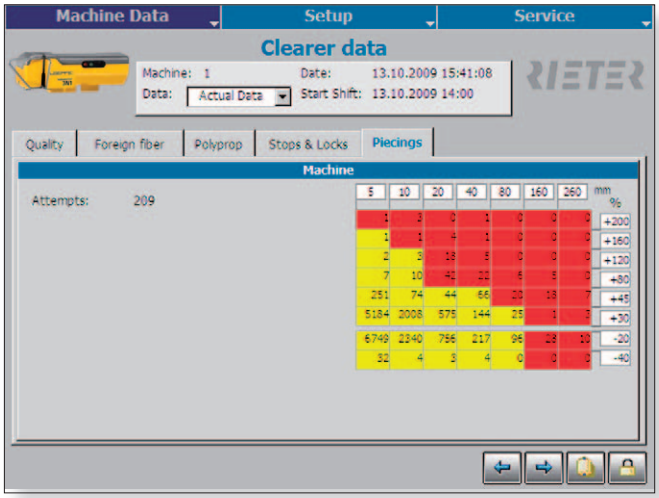
Polypropylene > Rotor

Sample length: of the rotor
Status: current state of the rotor



Stops and Locks

1. Amount of the particular state since shift start
2. Quality generally: amount of the particular state since shift start
3. HW/Dust Lock: amount of the particular state since shift start (depends on machine type)

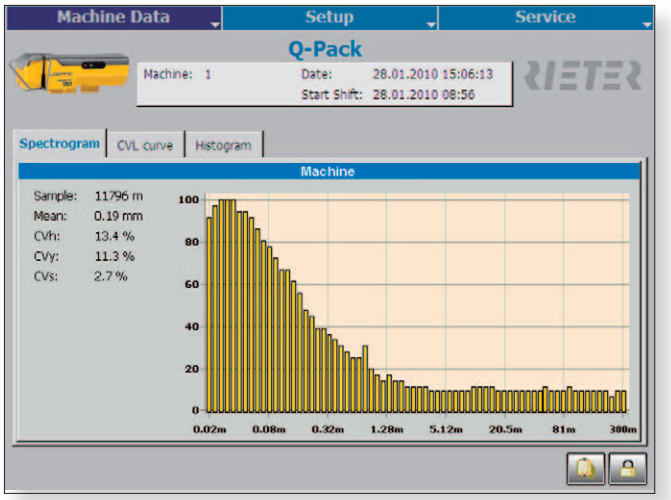


Piecings

Reports the classification of all faulty attempts during the piecing phase.

Q-Pack

Real time Online Laboratory for advanced analysis.

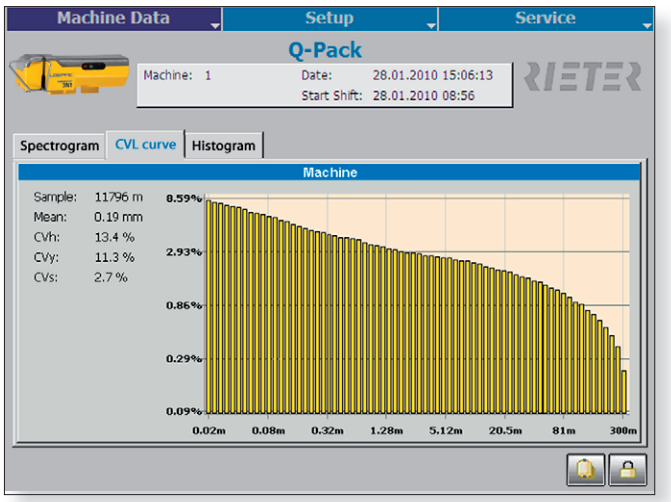


Spectrogram

Helps to analyze the yarn diameter profile for the presence of periodically occurring deviations.

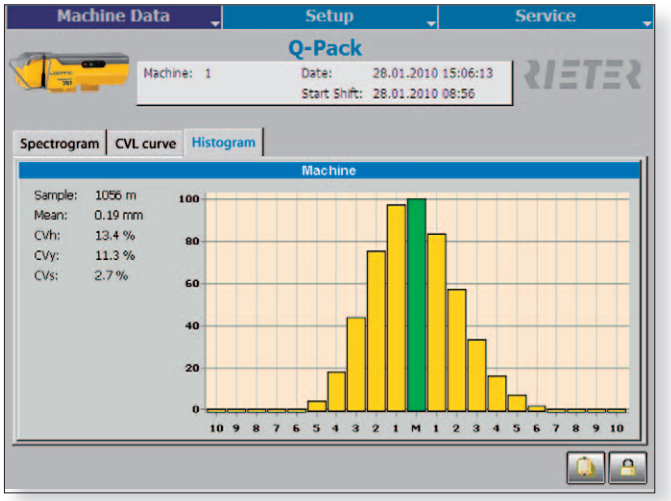
Sample: needed length for a picture of the spectrogram
Mean: reference mean
CVh = CV% hairiness (CV% on 2mm)
CVy = CV% yarn (CV% on 8mm)
CVs = CV% sliver (CV% on 500mm

y-axis: relative % to the max. amplitude



CVL Curve

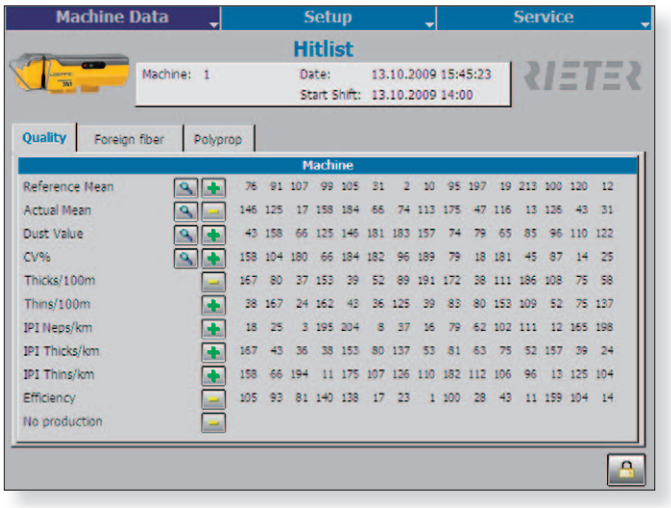
Analyse the CV% of a certain length.



Histogram

x-axis: +/-x/100 mm
y-axis: rel% to maximum value

Hitlist

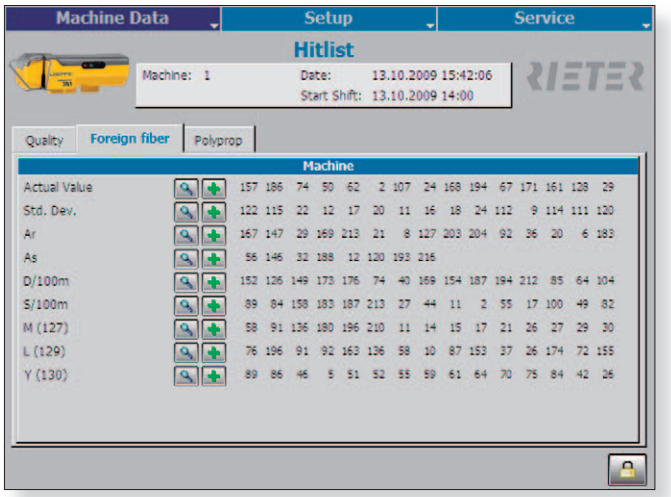


Quality

Displays the rotors with the highest or lowest measured or calculated values for Q.

Choose + for the highest values

Choose - for the lowest values

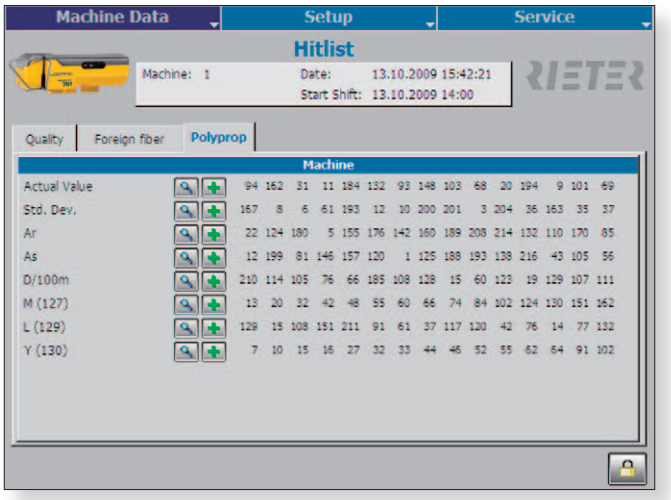


Foreign Matter

Displays the rotors with the highest or lowest measured or calculated F values.

A = variance of the signal for the displayed rotors
D = classified defects
S = short defects

M F127: short cluster accumulating (chain)
L F129: short cluster accumulating (distributed)
Y F130: long cluster accumulating
(Displays the counted too, even if cluster settings are not active)



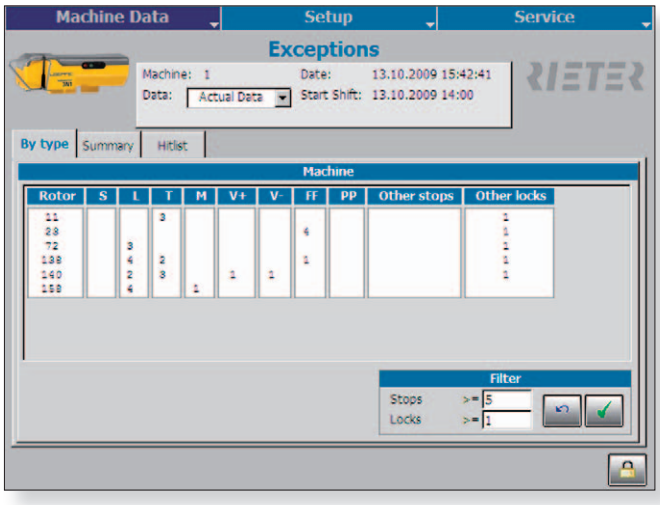
Polypropylene

Displays the rotors with the highest or lowest measured or calculated P values.

A = variance of the signal for the displayed rotors
D = classified defects
S = short defects

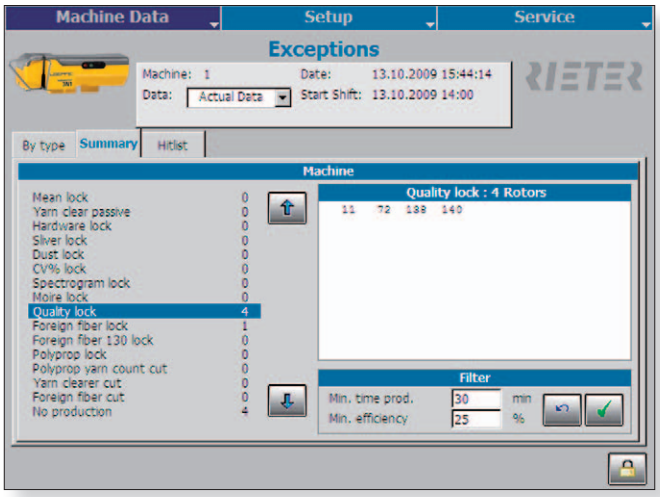
M F127: short cluster accumulating (chain)
L F129: short cluster accumulating (distributed)
Y F130: long cluster accumulating
(Displays the counted too, even if cluster settings are not active)

Exceptions



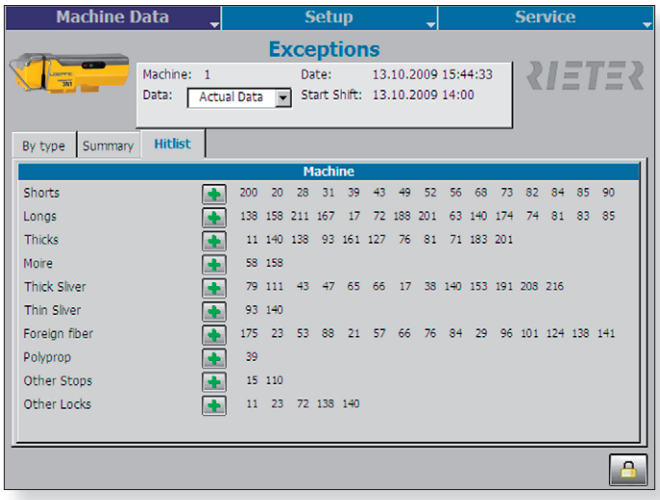
Exceptions by Type

Shows the corresponding rotor, depends on the limits set.
Values of the running shift or past shifts.



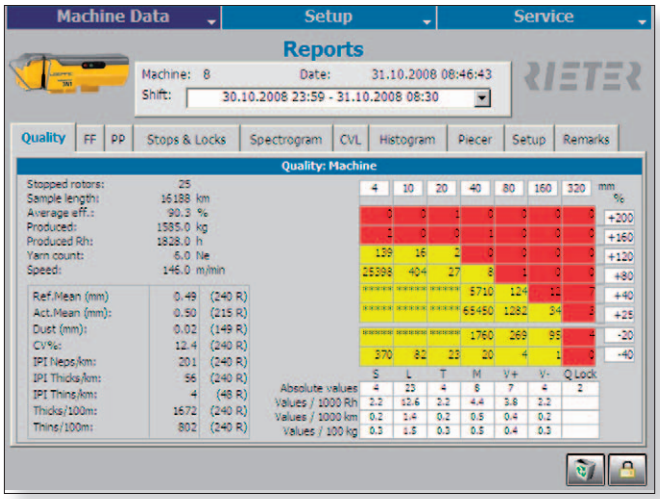
Exceptions Summary

Shows the summary of a certain state. The summary depends on the limits set.
Values of the running shift or past shifts.
In the blue field all the rotors are seen in the chosen state.



Exceptions Hitlist

The hitlist shows the rotors with the most or lowest stops.



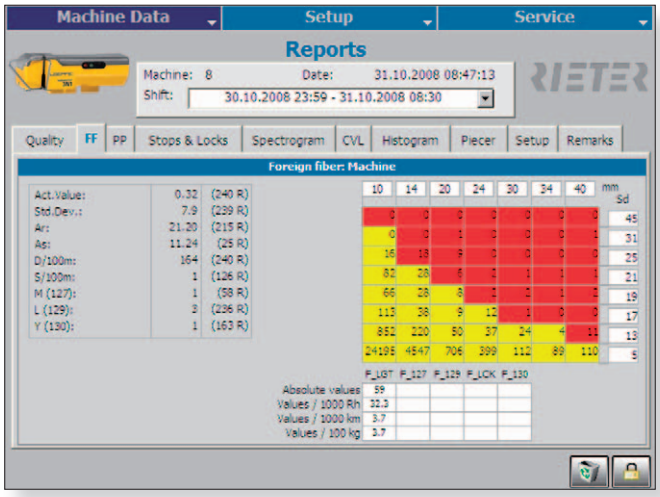
Reports

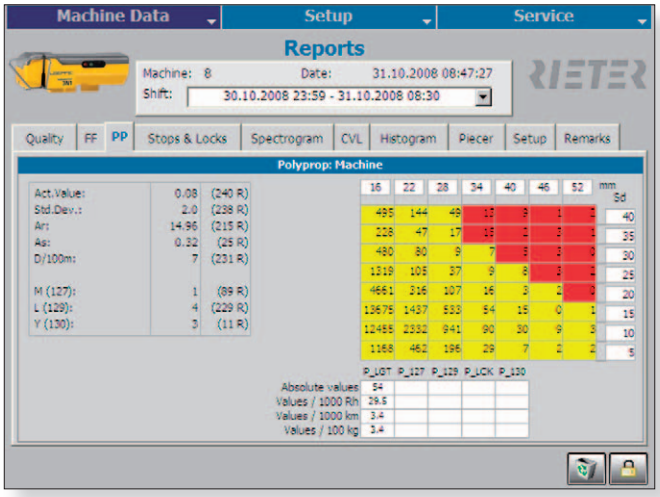
All important data can be displayed as a report. Such as machine data and setup.

A shift/lot needs to be ended for a report

It is possible to change the shift to the past 100 (see chapter Base Setup / Shifts)

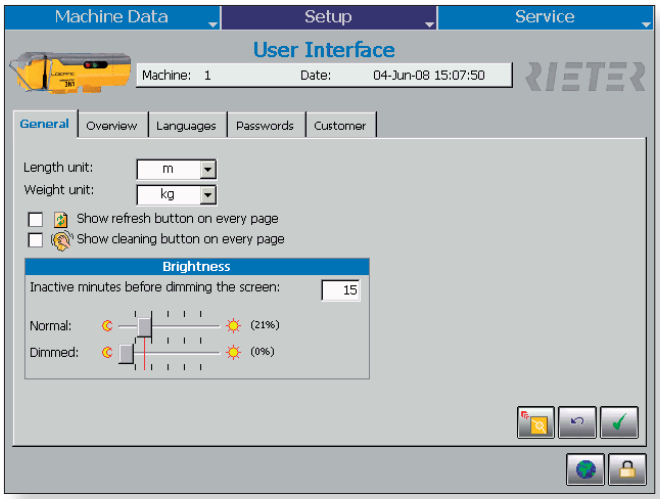
Note: Reports can be stored via USB
***(See chapter** Checks and Maintenance/USB)*





Base Setup

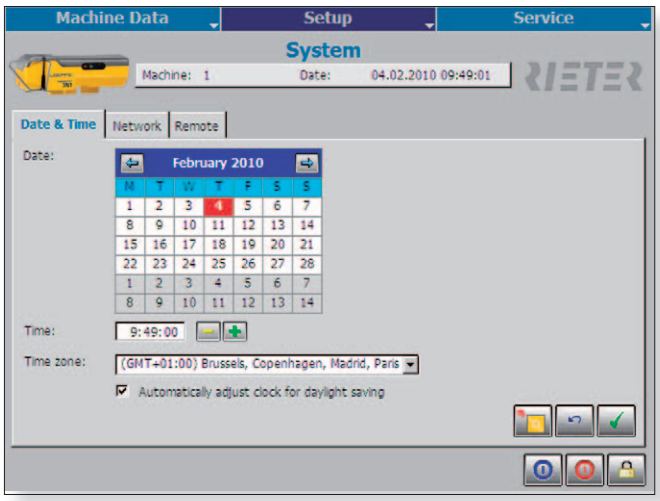
User Interface



Use the units of measurement system
Customize the Overview
Choose the user language
Change the Password if necessary
Customize the display logo

Note: UI Settings can be saved on USB
***(See chapter** Checks and Maintenance/USB)*

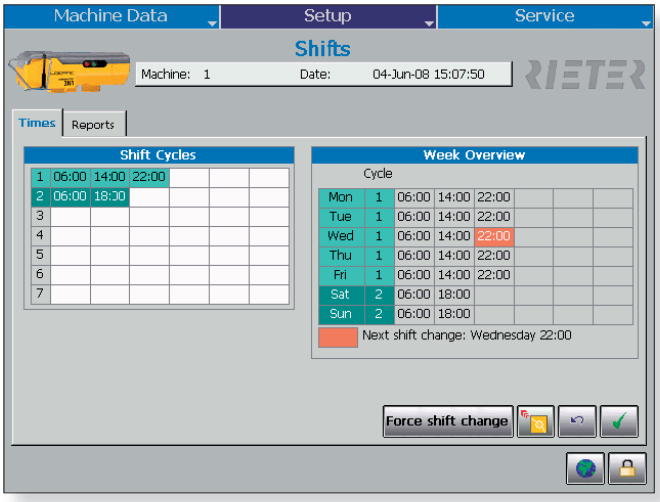
System



Configurate the system

Change options:
Region: choose the local Date/Time Zone
Network for external browser (Change IP will force an auto warm start)
Remote: license key

Shifts



Times:
Define up to seven different shift cycles. For a non-working day, do not enter time.

Select a shift cycle for each day of the week.

Reports:
Number of reports to be kept in memory. Once this number of report is reached, the oldest report is substituted by the new report.
The report language can also be a different language than the user interface language.

Checks and Maintenance

USB

USB Stick

On the front of the SCU, a USB port is available to save shift reports, to transfer settings from and to another machine and to upgrade the software by using a USB stick.

Procedure:

1. Open the cover of the USB port.
2. Plug in the USB stick.
3. Wait until one or two USB buttons are added to the button bar in the lower part of the display. This may take 10 seconds. If no buttons appear, the USB stick cannot be used in this page.

Function:

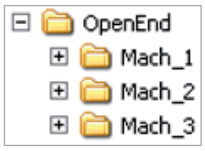
Save data to the USB stick.

Read data from the USB stick. This button only appears when the USB stick contains data that correspond with the current page.

Attention: Do not remove the USB stick while data transfer is busy. Wait for the confirmation message.After removing the USB stick, close the cover.

Folder Structure

All files are stored in the OpenEnd folder. This folder contains a subfolder for each machine, called "Mach" followed by the machine name.

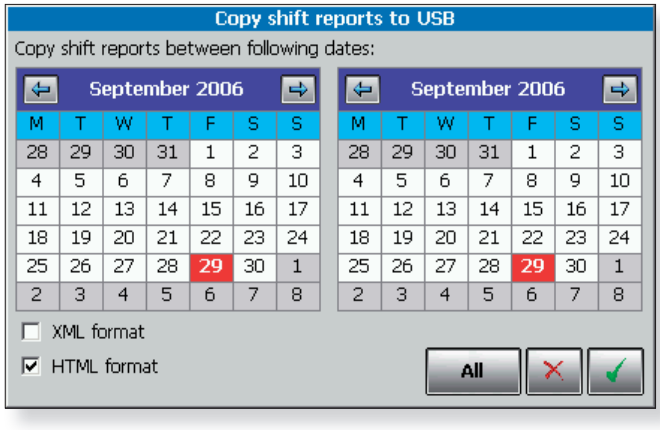


Shift Reports

To save shift reports on the USB stick, first open the Report page. Then touch 

to save the data. This will save all tabbed pages of the shift report.

- First, check the file formats to be saved (XML, HTML).
- To save shift reports of shifts that have ended between two dates, select the first and last date and confirm with  .
- To save all shift reports, touch All.



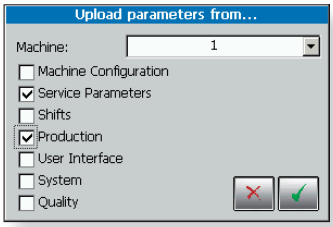
A confirmation message will be displayed upon terminating the action. Confirm.

The file ShiftReports_<yymmdd>_<yymmdd>.zip is saved and contains:

- One or more files Shift_<yymmdd>_<hhmm>_<yymmdd>_<hhmm>.htm or Shift_<yymmdd>_<hhmm>_<yymmdd>_<hhmm>.xml (the filename includes the shift start/end date/time)

Settings

Settings can be transferred from one machine to another.
By touching  in a settings page, all settings are downloaded to the USB stick: file Parameters_<machine number>.xml. A progress bar will be displayed while the settings are downloaded.



By touching  in a settings page, settings can be uploaded from the USB stick. Select the machine and which settings have to be copied to the SCU and confirm. A progress bar will be displayed while the settings are uploaded.

Read Stored Shift Reports

Take a copy of the newly generated shift report. Place it in a separate empty folder.
Unzip (extract) it in the empty folder. Thus you receive 2 new folders (ShiftReports_xxxxxx_xxxxxx_HTML.zip and ShiftReports_Common.zip). Unzip (extract) these 2 new folders together in the same folder. It should create the reports (html formate).

Q-Sensor LED

During normal operation, the red LED is off and the green LED blinks shortly. If there is a quality or other problem, the way the LEDs light up or flash indicates the kind of lock, stop or problem. Check the Machine overview page for details.

Sensing Head LEDs	Status and Color	Descriptions	Unlock Method	
			Button	Card
Green running light Red off (normal operation)	Run — Lime green	Yarn running	—	—
	Yarn br. — White	Yarn broken		
	Run inh. — Green yellow	Piecing in progress (run inhibit)		
	Q stop — Orange	Q stop		
	F stop — Fuchsia	Stop: F_LNG, F_127, F_129		
	P stop — Blue	Stop: P_LNG, P_127, P_129		
Green slow blink Red fast blink	Q stop — Orange	Piecer quality stop	This status disappears on run inhibit.	
Green on Red off	Q lock — Red	Ref. mean lock	(rotor)	Ref. Mean
Green slow blink Red off	Q lock — Red	Thin/thick yarn count lock	(rotor)	Ref. Mean
Green fast blink Red off	Q lock — Red	Thin/thick sliver lock	(yarn)	Sliver
Green off Red on	Q lock — Red	Quality lock & Pearl lock	(yarn)	Quality
	F lock — Purple	F cluster lock long: F_130, F_LCK	(yarn)	F
Green off Red fast blink	Q lock — Red	Moiré lock	(yarn)	Moiré
Green on Red slow blink	F lock — Purple	F lock	(yarn)	F
	P lock — Teal	P lock	(yarn)	P
Green on Red fast blink	Q lock — Red	CV% lock	(rotor)	CV%
	Q lock — Red	IPI neps/thin/thick lock	(yarn)	CV%
Green fast blink Red on	Q lock — Red	Spectrogram alarm lock & Remote spectrogram lock	(rotor)	Spectr.
Green on Red on	Dust lock — Brown	Dynamic/static dust lock	Clean sensing head	
Green fast blink Red fast blink	Forced — Cyan	Forced stop	This status disappears on run inhibit.	
	HW lock — Black	Can't stop lock, Forced locks & Hardware lock	(hardware)	HW
Green off Red off	No comm. — Gray	No communication, unlock, new mean	Consult technician.	

Cleaning

When? Clean the measuring slot of the Q-sensor regularly, for example at lot change. This will reduce dust locks. Always clean when a rotor is stopped for dust lock (both sensor LEDs on).

With? Use a cleaning swab from LOEPFE or equivalent. Use it either dry or dampened with optical lens cleaner. The swab may not be soaked to avoid damage to the sensor. Do not use any other liquids!

How? Drag the soft tip of the cleaning stick a few times through the measuring slot. When the LEDs go out automatically after removing the cleaning stick, the sensor is cleaned well.

Index Data Explanation

Q

Ref.Mean (mm): Reference mean value from adjust at the lot start or from a forced mean by the user. Measurement absolute in mm.
Act. Mean (mm): current mean in real time
Dust (mm): contamination of the Sensor (according to the empty and clean optic)
CV%: statistic calculation
IPI Neps/km: 2-4mm, +50% diameter deviation
IPI Thicks/km: 20-40mm, +30% diameter deviation
IPI Thins/km: 20-40mm, -30% diameter deviation
Thicks/100m: generally classified
Thins/100m: generally classified
S: stops short fault up to 80mm
L: stops long starts from 80mm
T: stops thin
M: stops Moiré
V+: stops thick sliver
V-: stops thin sliver
Q-Lock: Quality lock

F

Act. Value: Reference mean value from adjust at the lot start or from a forced mean by the user.
Std.Dev.: Standard deviation
A: variance of the actual value
Ar: variance running
As: variance stopped
D/100m: classified defects (matrix)
S/100m: short (up to 80mm)
M F127: short cluster accumulating (chain)
L F129: short cluster accumulating (distributed)
Y F130: long cluster accumulating
F_LGT: F matrix stop
F_127: chain of short F Cluster stop
F_129: distributet short F cluster stop
F_LCK: F Lock
F_130: long FF Cluster stop

P

Act. Value: Reference mean value from adjust at the lot start or from a forced mean by the user.
Std.Dev.: Standard deviation
A: variance of the actual value
Ar: variance running
As: variance stopped
D/100m: classified defects (matrix)
M F127: short cluster accumulating (chain)
L F129: short cluster accumulating (distributed)
Y F130: long cluster accumulating
P_LGT: P matrix stop
P_127 chain of short P Cluster stop
P_129: distributet short P cluster stop
P_LCK: P Lock
P_130: long PP cluster stop

Replacements of Sensor and SE-Board

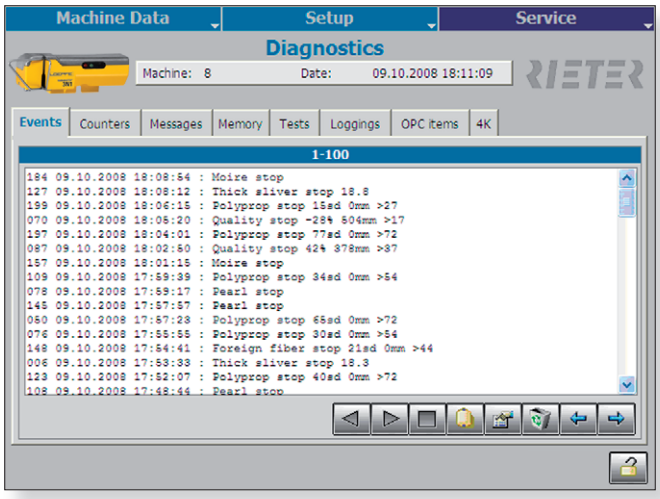
Replacement of the SH and its cables is possible while the machine is running. Just unplug the cables.
For any case of defective parts or malfunction please contact customer support.

Note: for all other changes you need to unplug the power for the according part.
After changing the SE board, please check the software version on menu *Service/Version*.
There should be one line with SE (1–n). Please force an SE program on page *Service/Machine Configuration* ***if there are divided sections or any other incompatibilities (software variations).***

Spare Part Numbers

Loepfe	Description
A016964900	Cleaning Tips
A280068200	SCU basic
A280068100	SCU full
905280100	SE board basic
A701000000	extension print for SE (Full Version)
905263110	Sensor basic

Loepfe	Description
905263000	Sensor full
V314103	Fuse for SCU
A080992900	Fuse for SE
P222004	Battery for SCU
A016957900	Battery for SE
045757000	USB Stick Loepfe

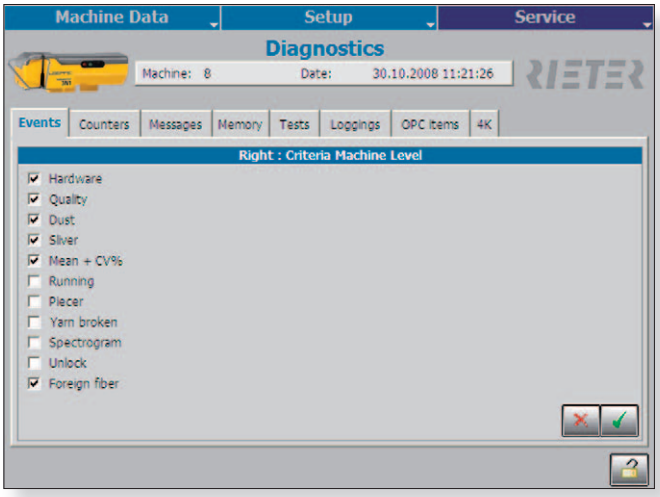


Diagnosis

Events

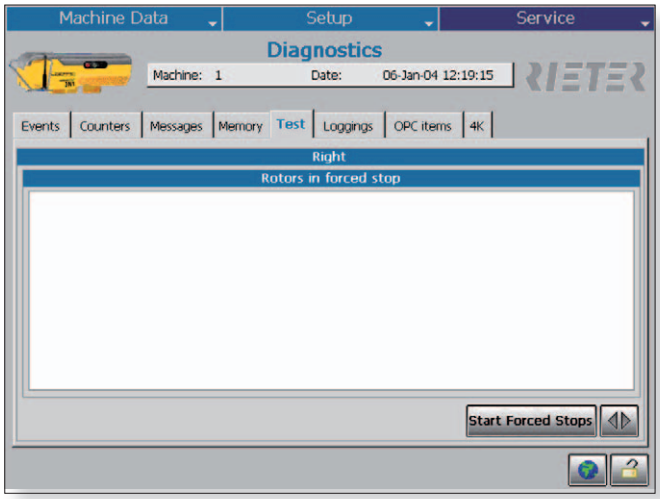
Use the filter for particular events

Event data:
- Rotor
- Date
- Time
- Stop reason (state)



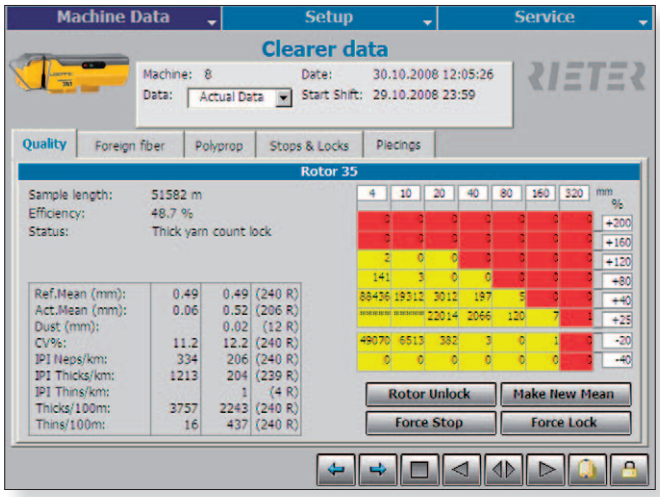
Filter Function as:

- Hardware
- Quality
- Dust
- Sliver
- Mean + CV%
- Running
- Piecer
- Yarn broken
- Spectrogram
- Unlock
- Foreign matter (incl. P)



Tests

Check by testing, if each particular sensor is working. Check by following the flashing of the LED on each sensor.

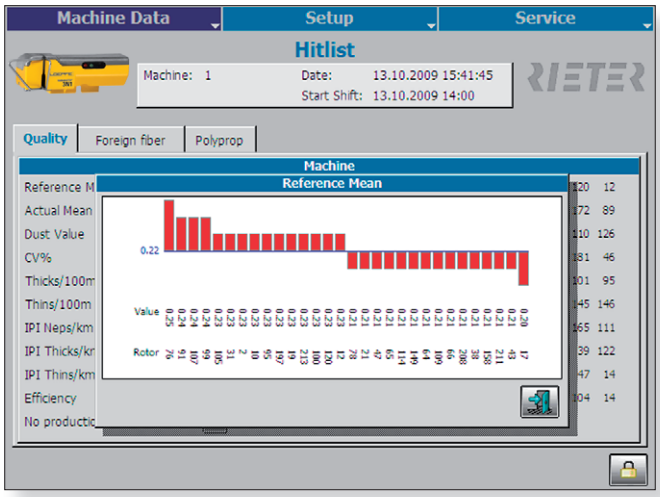


Trouble shooting

In case of troubles with one rotor position e.g. too many cuts, use the rotor clearer data for the following action:

Make new mean: New adjusting of the current yarn
Force Stop: Check for communication
Force Lock: for service purpose
Rotor Unlock: at overview screen

A locked rotor must be inspected by qualified personnel. A fault or a malfunction needs to be corrected.
After elimination, unlock the rotor.



Use statistic for further analysis. Figure cut bad running sensors for Q, F and P are shown in this graph.

LOEPFE 3N1 has a built-in diagnostic function. Technical problems are indicated by means of hardware locks.

Hardware locks can be cancelled by means of the unlock card, from the SCU or with button on sensing head. Since hardware failures of this kind can have a severe influence on yarn quality, they should be corrected and reset by qualified personnel only. Hardware locks should therefore be assigned to unlock card 3, which should be accessible to qualified personnel only.

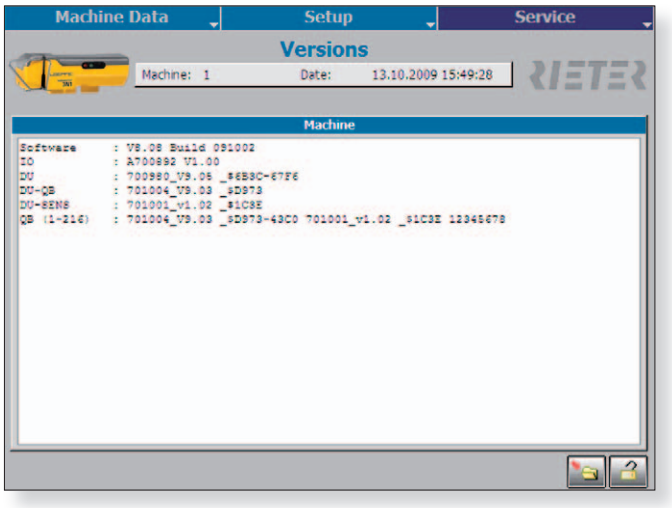
A hardware alarm is indicated on the Q-sensor: Both LEDs are flashing. The type of alarm can be viewed on the SCU screen.

Fault	Description	Possible cause	Recommended action
Hardware SE lock 0	Unspecified diagnostic lock after restart of SE	A lock was present before Power Down of the SE and is restored by the SCU	Correct lock situations before Power Down of SE Reset lock and check again
Hardware SE lock 1 (*)	The SH detects no Yarn signal although the rotor is in RUN state	Yarn not/not correctly in the SH measuring slit SH lower ceramic missing SH defective	Check Yarn position and guiding Replace SH
Hardware SE lock 2	Measured Yarn signal is too low	Yarn position wrong SH lower ceramic missing SH defective	Check Yarn position and guiding Replace SH
Hardware SE lock 3	Measured Yarn signal is too high	Measuring slit obstructed by dust or lint SH defective	Remove dust or lint Replace SH
Hardware SE lock 4	Too much Run/Stop transitions in the measured Yarn	Maximum piecing attempts reached (default 20 per shift) Yarn position wrong SH defective	Check piecing robot and spinbox components Check and correct Replace SH
Hardware SE lock 5	No communication with YM 3N1 SH	Cable unplugged or defective SH defective SE has a defective input	Connect or replace cable Replace SH Replace SE
Hardware SE lock 6	Minimum intensity signal. (F channel)	SH has no F-function SH defective	Install correct SH Replace SH
Hardware SE lock 7	Maximum intensity signal. (F channel)	Machine is producing blended yarn SH defective	Disable F-channel of YM 3N1 Replace SH
Hardware SE lock 8	Minimum intensity signal. (P channel)	SH has no P-function SH defective	Install correct SH Replace SH
Hardware SE lock 9	Maximum intensity signal. (P channel)	Machine is producing synthetic yarn SH defective	Disable P-channel of YM 3N1 Replace SH

Notes:
(*) = Function not present on stand-alone installations
SH = Sensing Head
SE = Section Electronics
SCU = Sensors Central Unit
YM 3N1 = YarnMaster 3N1

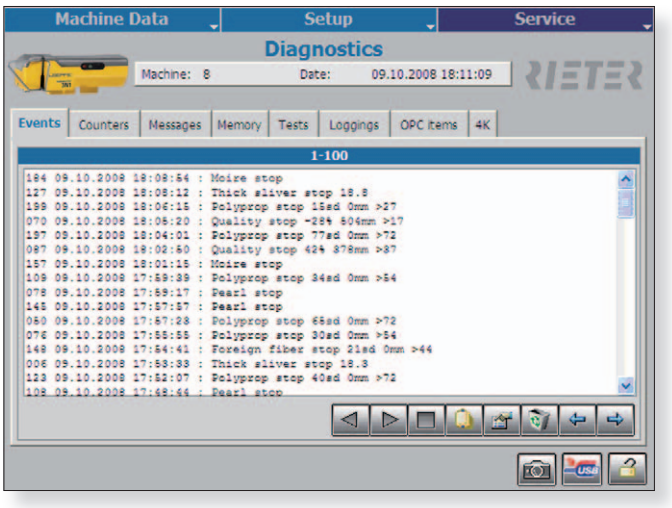
Service

Machine Configuration



Versions

The version is important for any support communication.



Snapshot

For any correspondence, please take a snapshot (takes about 20 minutes) and send it to Loepfe.

1. Plug in the USB-stick.
2. Wait until the camera button is added.
3. Push the camera button to start the snapshot.

Technical Data (Changes reserved)

System

Concept	Modular, integrated in spinning System / Components individually replaceable / Power supply depends on machine type
SCU	One control station per machine / Date and time indication / Data memory in case of power failure / Bus connection to section electronic / Data connection to machine control station LAN connection to local network
Operating	Setting of the conventional clearing parameters via touch screen
Operating temperature	+0° up to +50° C
Humidity	Up to max. 95% relative humidity not condensing
Section electronic	1 Board per Section (20 Rotors)
Sensing head	1 Sensor per rotor
Range of application	For staple-spun yarn of natural, synthetic or blends

Central Unit (SCU)

SCU	Graphics-capable display backlit and, touch screen Keyboard and mouse connection via USB possible Microsoft ® Windows CE ®
Connection	All type of machine: 24V DC SELV, +25%/-15% Max. Current: 4A / Fuse: 2xT3.15AL
Capacity of OE Spinning machine	Rieter R40: Up to 500 clearers can be connected
Settings/side	Rieter R40: 1 setting
Dimension	Approx. 483 x 266 x 83 mm (W x H x D)
Max. power consumption	- no lamp tree is connected: 30 Watt
	- lamp tree with lamps of 3W is connected: 45 Watt
	- lamp tree with lamps of 5W is connected: 53 Watt
Weight	Approx. 5.25 kg
Printing	Printout via USB stick

Evaluation Unit (Section Electronic)

SE-Board Rieter	20 rotors
Spinning speed	Up to 400 m/min
Max. power supply and consumption (incl. SH)	Basic: max. 675 mA at 24V DC SELV, +25%/-15% Full: max. 750 mA at 24V DC SELV, +25%/-15% Max current: 1.1A/fuse: 1xT2AL.

Sensing Head

Basic	1 Sensor for diameter measurement integrated
Full	3 Sensor for Q/F/P measurement integrated

Yarn Count Range (Optical scanning principle)

TK Type	Limit Range Coarse	Limit Range Fine
Sensor basic/full	Nm 5	Nm 100

Parameter Settings

Settings for thick and thin places

Default values	Valid values	To desable, set to
Matrix lengths in mm		
4, 10, 20, 40, 80, 160, 320	2 to 8, 6 to 18, 12 to 38, 22 to 78, 42 to 158, 82 to 318, 162 to 840 and between the lower length + 2 mm and the higher length – 2 mm.	—
Matrix diameter deviations in %		
-40, -20, 25, 40, 80, 120, 160, 200	-26 to -50, -20 to -34, 25 to 34, 31 to 74, 46 to 114, 86 to 154, 126 to 194, 166 to 350	—
Activated matrix squares for quality stop		
Default activated matrix squares: 71, 62, 53, 44, 35, 26, 17, 07	All matrix fields can be activated, except 01, 02, 11, 12, 13, 21, 22, 23, 31, 32 and 41.	Deselect/select matrix square
Piecer classification		
Sensitivity: 70 %	50 to 150 %	0 %
Moiré		
Rotor diameter: 33 mm	20 to 70 mm	
Yarn diameter deviation: +38 %	20 to 99 %	0 %
Sliver stops		
Thin place. Length: 3 m. Diameter deviation: -18 %.	1 to 9 m 2 to 30 %	0 m
Thick place. Length: 3 m. Diameter deviation: +18 %.	1 to 9 m 2 to 30 %	0 m
Yarn count lock		
Disabled	Length: 10 to 1000 m Deviation: 0.3 to 20 %	0 m
Neps or pearl channel		
Neps with respect to the reference mean: +50%	+5 to +170 %	0 %
Spectrogram analysis		
Maximum statistically secured wavelength: 300 m	37 to 300 m	0 m
Spectrogram lock: 0 %	10 to 255 %	0 %
Reference spectrogram lock: 0 %	10 to 255 %	0 %
Lock functions		
Quality lock: 3 stops per 1000 m	1 to 9 stops per 1000 to 16000 m	0 stops
Moiré lock: 3 stops per 1000 m	1 to 9 stops per 1000 to 16000 m	0 stops
Sliver lock: 2 stops per 1000 m (thick, thin)	1 to 9 stops per 1000 to 16000 m	0 stops
Neps lock: 3 stops per 5000 m	1 to 9 stops per 1000 to 16000 m	0 stops
Reference mean value lock: 15 %	4 to 30 %	0 %
CV% lock: 25 % (+ and -)	4 to 50 %	0 %
Unlock priorities and groups		
Quality, moiré and sliver belong to group 1 (unlock with card 1).	Card 1 to 3	—
CV%, spectrogram locks, yarn count and reference mean locks belong to group 2 (unlock with card 2).	Card 1 to 3	—
Technical locks, such as hardware locks belong to group 3 (unlock with card 3).	Card 1 to 3	—
Unlock switch: 0 (switched off)	0,1,2	0

Settings for colored fiber detection

Default values	Valid values	To desable, set to
Matrix lengths in mm		
10, 14, 20, 24, 30, 34, 40	2 to 12, 12 to 18, 16 to 22, 22 to 28, 26 to 32, 32 to 38, 36 to 198 and between the lower length + 2 mm and the higher length – 2 mm.	—
Matrix intensity values		
4, 16, 17, 19, 21, 25, 31, 45	4 to 15, 5 to 16, 17 to 18, 18 to 20, 20 to 24, 22 to 30, 26 to 44, 32 to 99	—
Activated matrix squares for foreign matter stop		
Default activated matrix squares: 71, 62, 53, 44, 35, 26, 17	All matrix fields can be activated, except 01, 02, 03, 04, 11, 12, 13, 21, 22, 31	Deselect/select matrix square
Stops		
Cluster detection: 1	1 to 9 (1= highest sensitivity)	0
Locks		
Long cluster detection: 2	1 to 9 (1= highest sensitivity)	0
Lock: 5 stops per 5000 m	1 to 9 stops per 1000 to 16000 m	0 m (10.4)
Unlock priorities and groups		0 m
Foreign matter belongs to group 1 = unlock with card 1.	Card 1 to 3	—

Settings for polypropylene detection

Default values	Valid values	To desable, set to
Matrix lengths in mm		
16, 22, 28, 34, 40, 160, 198	2 to 20, 18 to 26, 24 to 32, 30 to 38, 36 to 44, 42 to 50, 48 to 200 and between the lower length + 2 mm and the higher length – 2 mm.	—
Matrix intensity values		
5, 10, 15, 20, 25, 30, 35, 40	5 to 9, 6 to 14, 11 to 19, 16 to 24, 21 to 29, 26 to 34, 31 to 39, 36 to 99	—
Activated matrix squares for polypropylene stop		
Default activated matrix squares: 71, 62, 53, 44, 35, 26, 17	All matrix fields can be activated, except 01, 02, 03, 04, 11, 12, 13, 21, 22, 31	Deselect/select matrix square
Stops		
Cluster detection: 1	1 to 9 (1= highest sensitivity)	0
Locks		
Long cluster detection: 0	1 to 9 (1= highest sensitivity)	0
Lock: 5 stops per 5000 m	1 to 9 stops per 1000 to 16000 m	0 m
Unlock priorities and groups		0 m
Polypropylene belongs to group 1 = unlock with card 1.	Card 1 to 3	—

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