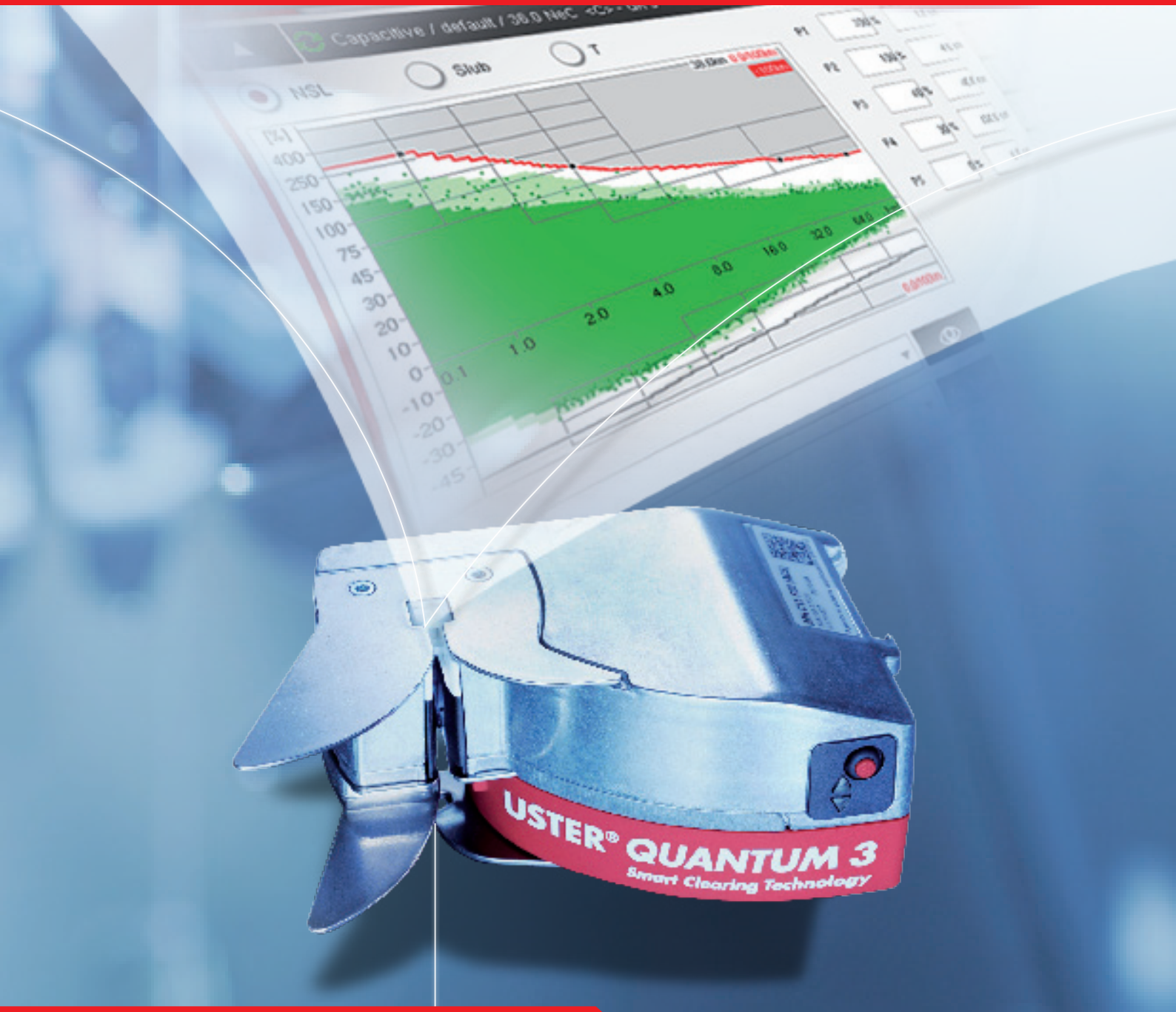
USTER® *QUANTUM 3*

THE YARN QUALITY ASSURANCE SYSTEM



TECHNICAL SPECIFICATIONS FOR WINDING

September 2010 / Version 3
SE 649

USTER®
Think quality

veronesi\TT\Schulung_Dokumente\On-line\Garnreiniger\UQC\SE-649_Technical specification Winding for sales and customers.doc

Contents

1 Basics of USTER® *QUANTUM 3*

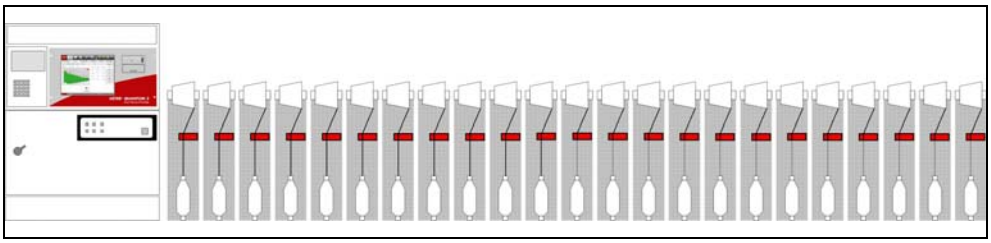


Fig. 1
The USTER® QUANTUM 3 on winding machine

1.1 Architecture

The USTER® *QUANTUM 3* is a yarn clearing and monitoring system for winding machines consisting of:

1. Central Clearing Unit 6 (CCU6). One control unit per winder. All settings and operational check of each position are made from the Central Clearing Unit
   - Standalone on all winders except Oerlikon Schlafhorst Autoconer 5
   - Integrated with winder Informator on Oerlikon Schlafhorst Autoconer 5
2. Intelligent clearer measuring heads (iMH) for each winding position.
3. Interface to the winding positions and connecting cables.

1.2 Scope of application

Yarn types:	For all spun yarns consisting of natural fibers, blended fibers, synthetic fibers and plyed yarns.
Languages:	GB, CN, TR, VN, DE, FR, IT, ES
Count range:	Ne_c 3 to Ne_c 200 / Nm 5 to Nm 340 / 2.9 to 200 tex
Maximum speed:	2200 m/min
General Ambient conditions:	- Temperature range +5 to 50°C / 41 to 122°F - Humidity up to 95%, not condensing

1.3 Scope of supply

iMH for each position, Central Clearing Unit (CCU6), Documentation, Tools, Yarn Boards, Yarn Grades

1.4 Miscellaneous

Printer:	USB Printout or via an optional portable printer
Access Rights:	Controlled through programmable passwords
Unit system:	Nec, New, Nm, Tex

1.5 Features of USTER® *QUANTUM 3* and options

Table 1 shows the individual features of the options.

OPTIONS	FEATURES	COMMENTS
Basic clearing	Yarn Body (N, S, L, T, CC)	Visualization of the yarn characteristics
	Smart limits (N, S, L, T, CC)	A proposed starting point for clearing limits
	Scatter plot (N, S, L, T, C, CC, J)	Visualization of the thick and thin places, count deviations and splices.
	N, S, L, T	Elimination of the disturbing thick and thin places
	C, CC	Count deviation clearing and monitoring
	Jp, Jm	Splice Clearing
	Cut forecast	A forecast of cut numbers per 100 km
	Technical alarms	Alert for technical problems
	Textile alarms	Alert for textile problems
Foreign matter **Vegetable Clearing** **(Option)**	Dense Area (FD, FL, VEG)	Identification of range where foreign fibers are located
	Smart limit (FD)	A proposed starting point for foreign fiber clearing limits
	Scatter plot (FD, FL)	Visualization of dark and light foreign fibers
	Dark foreign matter (FD) Light foreign matter (FL)	Elimination of dark and light foreign fibers
	On-line foreign matter classification	Classification of foreign fibers
	Identification of vegetables	Separation of vegetable matter
	On-line vegetable classification	Classification of vegetable matter
Polypropylene fibers (Option)	Smart limit (PP)	A proposed starting point for polypropylene clearing limit
	Scatter plot (PP)	Visualization of polypropylene fibers
Q-Data (Option)	Evenness (CV)	Determination of the yarn evenness
	Imperfections	Determination of the frequent thick places, thin places and neps
	Basic on-line classification (NSLT, FD, J and VEG)	Classification of disturbing thick and thin places, foreign fibers, splices and vegetables
	Class alarms	Triggering of alarm if the number of disturbing faults has exceed the selected number of faults
	Periodic Faults (PF)	Detection of periodic faults
Hairiness (Option)	Absolute hairiness measurement	Determination of the hairiness value
	Exception spindle detection	Recognition of spindles with excessive hairiness
Expert (Option)	Expert	Access to the data output for Expert System and centralized data collection and reporting
Advanced Classification (Option)	Extended Classes	Classification of additional classes in NSLT, F, VEG
	Tailored classes	Classes can be selected by customers
Lab On-line (Option)	Software pack	Software pack consists of Hairiness, Advanced Classification and Expert

Table 1 Features of Basic Clearing and options

1.6 Features versus measuring head types

Table 2 below describes which type of USTER® *QUANTUM 3* sensors for each measuring head is appropriate for which kind of application.

USTER® *QUANTUM 3* SENSORS							
MEASURING HEAD TYPES		Capacitive C15	Capacitive C20	Capacitive C15 F30	Capacitive C20 F30	Optical O30	Optical O30 F30
FEATURES	BASIC	X	X	X	X	X	X
	FOREIGN MATTER (Option)	---	---	X	X	---	X
	VEGETABLE (Option)	---	---	X	X	---	---
	POLYPROPYLENE (Option)	---	---	O*	O*	---	---
	Q-DATA (Option)	O	O	X	X	O	X
	HAIRINESS (Option)	---	---	O	O	---	O
	USTER® *QUANTUM EXPERT 3*	O	O	O	O	O	O
	ADVANCED CLASSIFICATION (Option)	O	O	O	O	O	O
	LAB ONLINE (Option)	---	---	O	O	---	O

Table 2 The USTER® QUANTUM 3 sensors and options

Key:

X This feature is included in this version of the sensor

O Product Option Key (POK) is needed to have access to the feature mentioned in the header of this column

O* Hardware upgrade required in the Central Clearing Unit 6 (CCU6) to have access to the feature

--- Not available with this iMH type

1.7 Comparison, capacitive versus optical measuring principle for basic clearing

Table 3 shows the comparison capacitive versus optical measuring principle for basic clearing. In the following table there are a few remarks to the selection of the clearer type.

OPTIONS	Capacitive principle	Optical principle
Basic difference	A capacitive measuring signal is proportional to the cross-section of a yarn	An optical measuring system is proportional to the diameter of a yarn
Sensitivity	A thick place with 3 times more fibers in the cross-section than average produces a signal of +200%	A thick place with 3 times more fibers in the cross-section than average produces a signal of +73% (Exception: N, S faults)
Application range	For most of the yarns the capacitive principle can be utilized.	For all the yarns the optical principle can be utilized.
Contamination	The capacitive system needs less cleaning of the measuring zone. Particularly useful in dirty environments	The optical system needs more cleaning of the measuring zone
Exception 1: Conductive fibers	The capacitive system is affected by conductive fibers and should not be utilized for such yarns	The optical system is not affected by conductive fibers
Exception 2: Dyed yarn	The capacitive system is not affected by color variations	The optical system is affected by color variations
Exception 3: Wet splicing	It is recommended to minimize the amount of water used for splicing to protect the clearer and the machine.	The optical system is recommended
Exception 4: Wet spun linen	Not recommended	The optical system is recommended

Table 3 Comparison capacitive versus optical measuring principle for basic clearing

2 Count range of the USTER® *QUANTUM 3* sensor

The count range of the individual clearer types is shown in Fig. 2. Table serves for the identification of the correct clearer type and explains the count range for colored foreign fiber detection (Option F 30) and polypropylene fibers (Option PP).

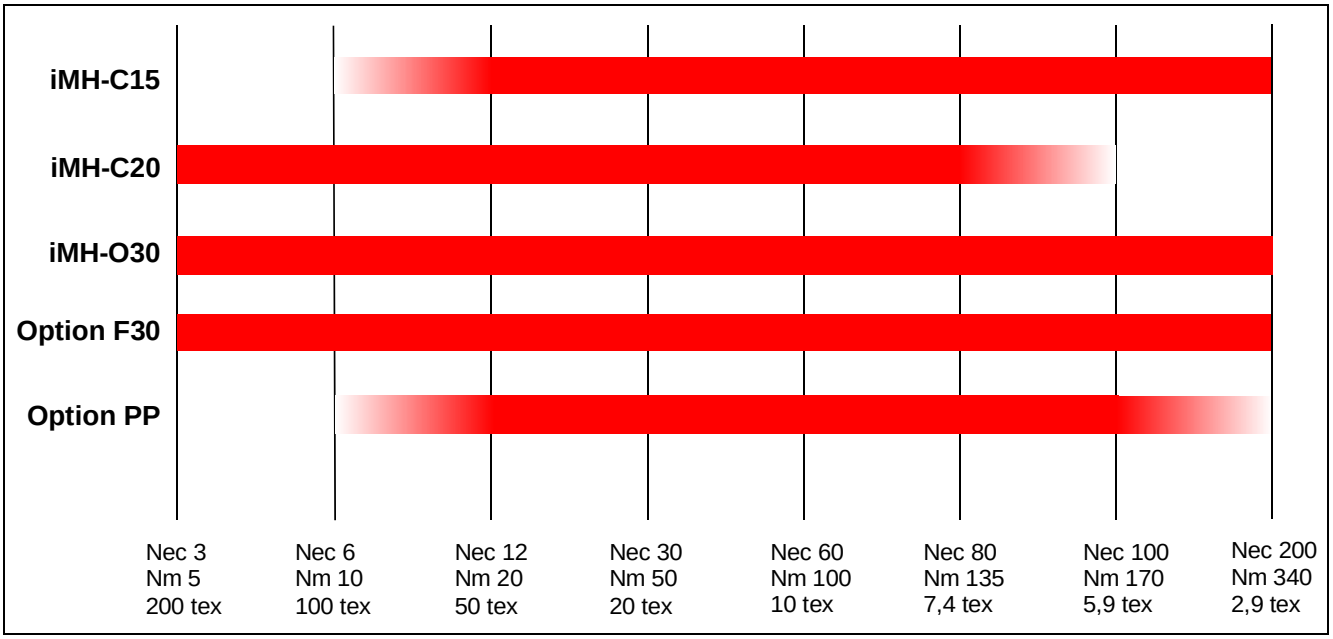


Fig. 2 The count range of the USTER® QUANTUM 3

3 Winding machines

Table 4 shows the winding machines on which the USTER® *QUANTUM 3* can be used:

Manufacturer	New machines	Retrofit
Murata	Murata PC 21C	Murata PC 21C
Oerlikon Schlafhorst	Oerlikon Schlafhorst Autoconer 5	Oerlikon Schlafhorst Autoconer 338 Oerlikon Schlafhorst Autoconer 5
Savio	Savio Orion Savio Polar	Savio Espero Savio Orion Savio Polar
Qingdao	Qingdao Smaro	Qingdao Smaro

Table 4 Winding machines

4 Cut alarms, Quality alarms, Special Counters and Logbook

Table 5 shows the technical and textile alarms: In the table the following abbreviations are used:

Abbreviations:

Q = Q-Data F = Foreign fibers H = Hairiness PP = Polypropylene A = Advanced Classification

Choices	Subject	Abbreviation	Options needed	Comment
Yarn fault alarms	Short thick places	NSA	Basic	Monitoring of the fault frequency
	Long thick places	LA	Basic	
	Thin places	TA	Basic	
	Wrong count	CA	Basic	
(ALARM)	Count deviation and uneven, long thick and thin places	CCA	Basic	
	Foreign matter	FA	F	
	Polypropylene fibers	PPA	PP	iMH C15F30PPand C20F30PP
	Periodic faults	PFA	Q	Monitoring of the fault frequency
	Splice failure ration alarm	JRA	Basic	Monitoring of the frequency
Q-Registration **Q-Blocking** **Q-Cut (Ejection)** **Q-Blocking / Sucking**	Coefficient of variation, mean of entire machine or article	CV-MV	Q	Absolute monitoring of the CV-MV; upper and lower limit.
	Coefficient of variation per position	CV-SP	Q	Relative deviation of the CV-MV value
	Hairiness, mean value of the group	H-MV	H	Absolute monitoring of the H-MV value; upper and lower limit.
	Hairiness per winding position	H-SP	H	Absolute deviation of the H-MV value
	Class Alarm	CMT	Q	5 individual classes for alarm monitoring can be selected
	Frequent neps	IP	Q	Monitoring of the frequency
	Frequent thick places	IP	Q	Monitoring of the frequency
	Frequent thin places	IP	Q	Monitoring of the frequency
	Tailored classes (NSL)	tNSL	A	Monitoring of the frequency
	Tailored classes (T)	tT	A	Monitoring of the frequency
	Tailored classes (FD)	tFD	A	Monitoring of the frequency
	Tailored classes (FL)	tFL	A	Monitoring of the frequency
Special Counters	Upper yarn cuts	U	Basic	Monitoring of the frequency
	Machine-associated additional cuts	A	Basic	
	Yarn jump monitoring / registration/ alarm	JPM / JPM reg / JPA	Basic	
	Drum wrap monitoring / registration/ alarm	DWM / DWM reg /DWA	Basic	
	Drum signal monitoring	DSM	Basic	
	Special cuts	SPC	Basic	
Logbook	Recording of all changes and alarms	Logbook	Basic	Monitoring of the logbook entries

Table 5 Cut alarms, Quality alarms, Special Counters and Logbook

5 Reports

Table 6 shows various reports. Reports can be transferred to an USB stick or to an optional printer.

Groups	Feature	Per position		Per group		Necessary options	Comment
		Display	Printout	Display	Printout		
Machine data	Production time, effective running time, winding speed	---	---	✓	✓	Basic	
	Produced yarn length	✓	✓ *	✓	✓	Basic	
Settings	Setting of the clearing- and alarm parameters	---	---	✓	✓	Basic	
Yarn Faults	Number of all yarn faults YF absolute	✓	---	✓	✓	Basic	
	Number of all yarn faults YF / 100 km	✓	✓ *	✓	✓	Basic	
	Number of all yarn joints YJ / absolute	✓	---	✓	✓	Basic	
	Number of all yarn joints YJ / 100 km	✓	---	✓	✓	Basic	
	Number of N, S, L, T, Cp, Cm, CCp, CCm absolute	✓	---	✓	✓	Basic	
	Number of N, S, L, T, Cp, Cm, CCp, CCm / 100 km	✓	✓ *	✓	✓	Basic	
	Periodic Faults absolute	✓	---	✓	✓	Q	List of reports: Per shift, per day, per article Intermediate report / present shift Last shift (can also be configured as automatic report)
	Periodic Faults / 100 km	✓	✓ *	✓	✓	Q	
	Foreign fibers, grey or colored yarns, FL, FD absolute	✓	---	✓	✓	F	
	Foreign fibers, grey or colored yarns, FL, FD / 100 km	✓	✓ *	✓	✓	F	
	Polypropylene fibers PP, absolute	✓	---	✓	✓	PP	
	Polypropylene fibers PP / 100 km	✓	✓ *	✓	✓	PP	
	Faulty yarn joint Jp, Jm absolute	✓	---	✓	✓	Basic	
	Faulty yarn joint Jp, Jm / 100 km	✓	✓ *	✓	✓	Basic	
	Cuts U, JPM, SPC, DSM, DWM absolute	✓	---	✓	✓	Basic	
	Cuts U, JPM, SPC, DSM, DWM / 100 km	✓	✓ *	✓	✓	Basic	
Yarn Fault Alarms	Yarn fault alarms NS, L, T, F, C, CC absolute	✓	---	✓	✓	Basic	
	Yarn fault alarms NS, LT, F, C, CC /100km	✓	✓ *	✓	✓	Basic	
Yarn Fault Alarms	Periodic Faults alarm PF absolute	✓	---	✓	✓	Q	
	Periodic Faults alarm PF / 100 km	✓	✓ *	✓	✓	Q	List of reports:
Q Alarms	Number of CV alarms CVp, CVm absolute	✓	---	✓	✓	Q	Per shift, per

Groups	Feature	Per position		Per group		Necessary options	Comment
		Display	Printout	Display	Printout		
	Number of CV alarms CVp, CVm / 100km	✓	✓ *	✓	✓	Q	day, per article Intermediate report / present shift Last shift (can also be configured as automatic report
	Number of Hairiness alarms Hp, Hm absolute	✓	---	✓	✓	H	
	Number of Hairiness alarms Hp, Hm / 100km	✓	✓ *	✓	✓	H	
	Number of Class-alarms absolute	✓	---	✓	✓	Q	
	Number of Class-alarms / 100 km	✓	✓ *	✓	✓	Q	
	Number of Imperfection alarms absolute	✓	---	✓	✓	Q	
	Number of Imperfection alarms / 100 km	✓	✓ *	✓	✓	Q	
Exceptions SP	Exceptions YF, YA, J	✓	✓ *	---	---	Basic	
	Exceptions F, FA	✓	✓ *	---	---	F	
	Exceptions QA	✓	✓ *	---	---	Q	
Q Data	Coefficient of variation per group CV-MV	---	---	✓	✓	Q	
	Coefficient of variation per position CV-SP	✓	✓ *	---	---	Q	
	Mean imperfection counts 12 in different classes / 1 km	✓	✓	✓	✓	Q	
	Classification of NSLT faults / 100 km, absolute	✓	✓	✓	✓	Q, A	
	Classification of FD-faults / 100 km, absolute	✓	---	✓	✓	Q, F	
	Classification of FL-faults / 100 km, absolute	✓	---	✓	✓	Q, F	
	Classification of VEG-faults / 100 km, absolute	✓	---	✓	✓	Q, F	
	Hairiness, mean value of the group H-MV	---	---	✓	✓	H	
	Last value of the hairiness per winding position H-SP	✓	✓ *	---	---	H	
Event reports	Yarn faults (N, S, L, T, C/CC, F, VEG, PP, PF)	✓ **	✓ **	✓ **	✓ **	Basic, F, PP	Yarn faults are also displayed showing size, intensity and classification.
	Textile alarms (NS, L, T, C/CC, F, Q, PF) Blockings/Cuts/Registrations)	✓ **	✓ **	✓ **	✓ **	Basic, F, Q, H, A	
	Other	✓ **	✓ **	✓ **	✓ **	Basic	

Table 6 Various reports of the USTER® QUANTUM 3

Abbreviations:

Q = Q-Data

F = Foreign fibers

H = Hairiness

PP = Polypropylene

A = Advanced Classification

✓ Available

✓ * Available if exceptions are defined and “Print all SP (spindle positions)” is selected in the menu “Configuration- Exceptions”.

✓ ** Available if events are defined and selected in the menu “Configuration-Event report”..

--- Not available

Uster Technologies AG
Sonnenbergstrasse 10
CH-8610 Uster / Switzerland

Phone +41 43 366 36 36
Fax +41 43 366 36 37

www.uster.com
sales@uster.com

USTER®
Think quality