USTER® TESTER 6

The Total Testing Center™

Technical Data

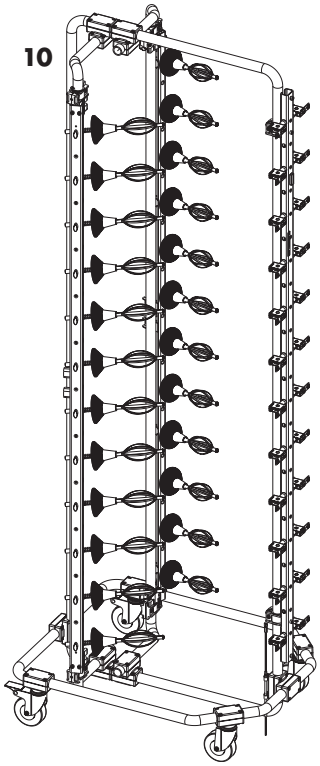
November 2021

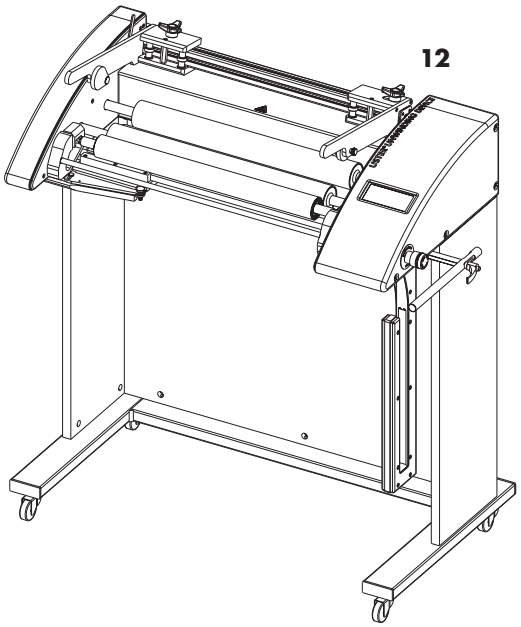
USTER®
Think quality

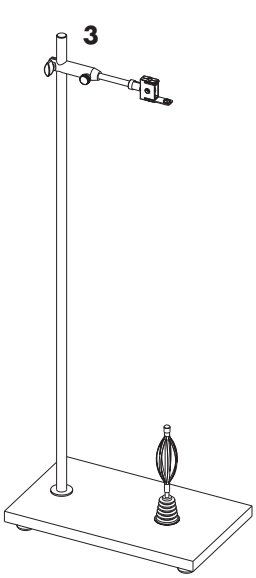
Capacitive and optical sensor technology in the Uster Tester 6 opens the door to spinning mill management. Showing spinners the full picture, with all the options for assured quality and cost-effective production.

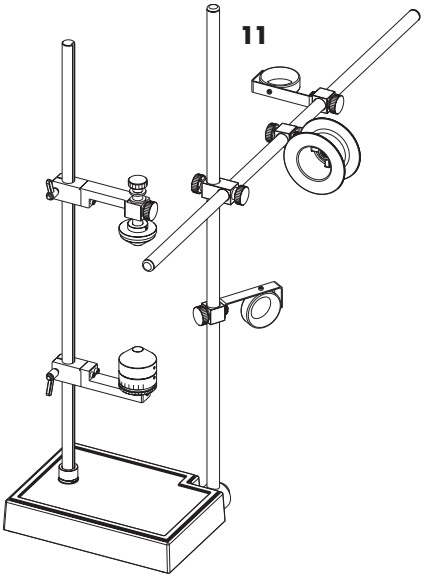
Elements

of the Uster Tester 6-S800 installation









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Basic installation

1 Test unit
- Sensor CS, evenness unit
- Sensor Temperature and Humidity (integrated)

1a Changer / Yarn feeder (only for UT6-S800/A)
2 Control unit
3 Single package carrier (only for UT6-S800/SA)
4 Table set

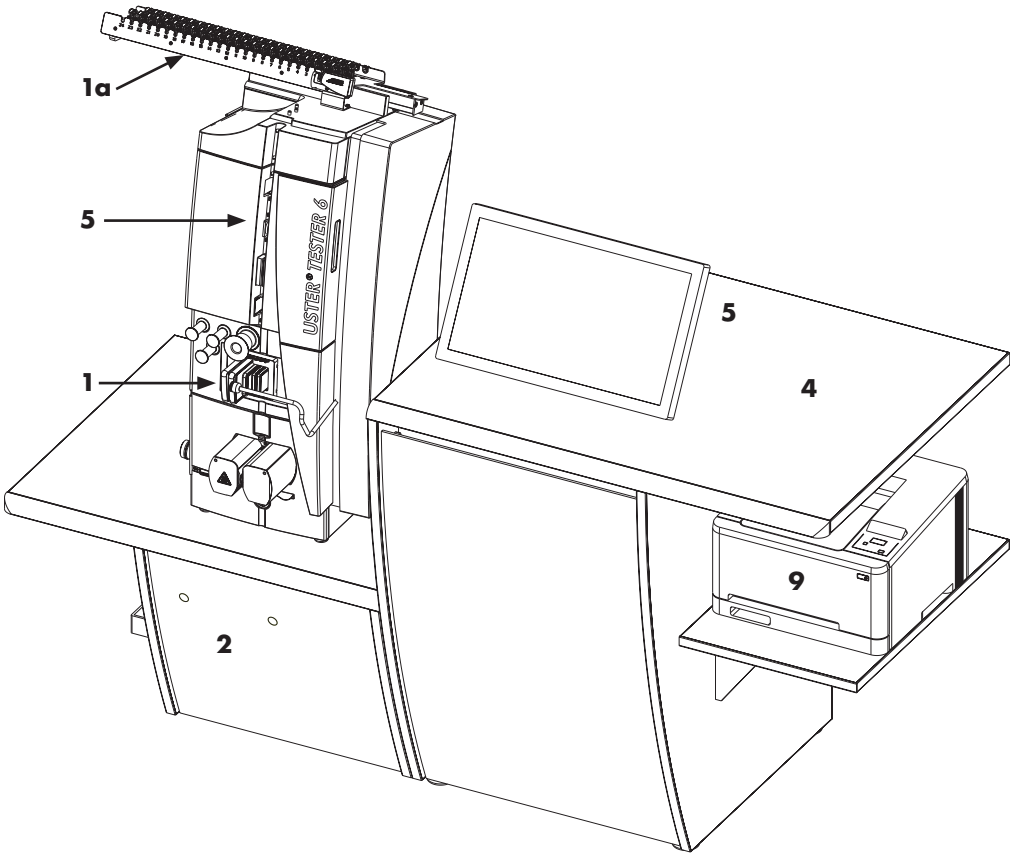
Options

5 Additional measuring units
- Sensor OH, hairiness measuring unit
- Sensor HL, hairiness length measuring unit
- Sensor OM, multifunctional measuring unit
- Sensor OI, impurity measuring unit
- Sesnor FA, yarn count measuring unit

6 Sensor MS120, coarse sliver evenness measuring unit (no illustration)
7 KBS, Knowledge Based System (no illustration)
8 FYP, Fancy Yarn Profile (no illustration)
9 Printer provided by the customer

Special Accessories

10 Package carrier
11 Large Uster unwinding device
12 Uster unwinding device with drive



Basic installation

Overall Installation

Functions

- Capacitive measurement of mass variations in staple yarns, rovings and slivers
- Capacitive measurement of imperfections in staple yarns
- Integrated Uster Quality Expert for linking the laboratory instruments with online monitoring
- Analysis, evaluation and data storage of the measurement values
- Automatic comparison with the benchmarking tool Uster Statistics
- Editor for customizing reports and settings of mill limits
- Smart view focusing on exceptions and outliers
- Filter functions for quick data selection and preparing of long-term reports
- Simulation of yarn boards, woven and knitted fabrics

Versions

- Uster Tester 6-S800/A (automatic version)
- Uster Tester 6-S800/SA (semi-automatic version)

Included in the delivery

- Test unit
- Control unit for Uster Tester 6 and Uster Quality Expert
- Touchscreen
- Application software
- Table set
- Large Uster unwinding device
- Package carrier (Uster Tester 6-S800/A)

Subsystem of the Uster Tester 6-S800 basic version:

Test unit (1)

Sensor CS

- Capacitive measurement of mass variations in staple yarns, rovings and slivers
- Capacitive measurement of imperfections in staple yarns
- Measurement range: approx. 1 tex to 12 ktex (limitation according to fiber type is possible)

Sensor Temperature & Humidity

- Integrated sensor for measurement of temperature and humidity in the environment of the test unit
- Temperature: ±0.3% at a temperature of 20 °C
- Humidity: ±3 % rH at a temperature of 20 °C

Conveyor S

- Material conveying system for yarn, roving and sliver
- Testing speed from 10 up to 800 m/min depending on the test mode

Base S

- Absorber for removal of tested yarn

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Changer/ Yarn feeder (1a)	**Automatic version only**	– Automatic selection of the yarn from the package changer and insertion into the measuring slot – Setup of 24 feeder lines, run automatically even when a within fail – Later continuation of the incomplete test
Control unit (2)	**Uster Tester 6 computer software**	– Uster Tester 6 intuitive touch application software – Windows Embedded 8.1 operating system – System pre-configured and locked down – Simple full system update process
	Uster Tester 6 computer hardware	– Industrial computer with Intel® processor – 3 internal hard drives for data security and system redundancy – 500 GB test data storage
	Uster Tester 6 computer accessories	– Large easy to read touch screen monitor
	Uster Quality Expert computer software	– Uster Quality Expert server software pre-installed – Uster Quality Expert client software 'Click Once' installation – Windows operating system – System pre-configured – Customer configurable networking
	Uster Quality Expert computer hardware	– Industrial computer with Intel® processor – 3 internal hard drives for data security and system redundancy – 500 GB quality data storage
Client	**Uster Quality Expert client hardware**	– provided by customer – minimum Windows 10, Service Pack 1 operating system

Options

Additional measuring units (5)	**Application**	Determination of additional yarn parameters (simultaneous with the determination of mass variation and imperfections)
Sensor OH Hairiness measuring unit (5)	**Application range**	Measurement of yarn hairiness of staple fibers in the range of approximately 5 to 1,000 tex (possible limitation according to the fiber type)
Sensor HL Hairiness Length measuring unit (5)	**Application range**	– Measurement of hairiness length of staple fibers in the range of approximately 5 to 100 tex (possible limitation according to the fiber type) – Classification in 7 length classes
Sensor OM Multifunctional measuring unit (5)	**Application range**	Appearance: Measurement of yarn diameter, shape, density and diameter variation of staple fibers Twist: Identify the level of yarn twist and twist variation for 100% CO, PES, CV, CMD, CLY and their blends, carded and combed for ring yarn and compact yarn A sensor combination from CS, OH and OM is needed, not applicable for plied yarns, slub yarns, core-spun yarns, crepe yarns (high twist), siro-spun yarns, technical yarns Frequent Occurrences: Measurement of frequent occurrences (FO) for conductive staple fiber yarns In the count range of approximately 5 to 200 tex (possible limitation according to the fiber type)
Sensor OI Impurities measuring unit (5)	**Application range**	Measurement of yarn trash and dust of cotton or cotton blends in the range of approximately 5 to 200 tex (possible limitation according to the fiber type and fiber color)

Sensor MS120 Coarse sliver evenness measuring unit (6)	**Application range**	Additional measuring unit for measuring of coarse sliver, wool tops and converter tops in the range of approximately 12 ktex to 80 ktex (possible limitation according to the fiber type)
Sensor FA Yarn count measuring unit (5)	**Aplication range**	– Measurement of absolute yarn count for single yarns in the range of approximately 5 to 100 tex – Test length determination according ISO 2060 or selectable by the customer
KBS Knowledge Based System (7)	**Function**	– Knowledge based software for the support of finding the cause of the periodical faults in the spectrogram – KBS decide between defective machine parts and drafting faults
FYP Fancy Yarn Profile (8)	**Function**	– Fancy Yarn Profile for the evaluation of slub yarns – Measurement of quality data number of slubs, mass increase, slub distance, mass decrease after a slub.

Special Accessories

Package carrier	**Application range**	– Packages carrier for creeling and transportation up to 40 bobbins or 12 packages – Available for short and long staple
Uster unwinding device with drive (automatic)	**Application range**	– Uster unwinding device for roving, rubbing and sliver – Possibility of automatic length determination and manual cutting device
	Take-up speed	– 25, 50, 100 or 200 m/min
	Package dimensions	– Roving tube Ø min. 50 mm, length max. 580 mm, weight max. 10 kg

Application Software for Uster Tester 6-S800

Reports	**Type of report**	– Standard test report of the measurement series – Pre-defined table reports and graphical reports for different application – Long-term reports – Customized reports
	Display and printout of the reports	– Live view report during the measurement – Analysis tool with all measured data and graphical output – Smart view report for exceptions and outliers – Automatic printout possibility after the measurement
	Limit values	– Setting of customized limits according to the Uster Statistics, standard deviation, relative and absolute values – Automatic verification of the measured values – Measured values which exceed the limit will be marked with red color in the reports
Numerical results Sensor CS	**Unevenness U**	Measurement of mass unevenness by the help of the irregularity
	Coefficient of variation CV_m	Measurement of mass unevenness by the help of the coefficient of variation
	Coefficient of variation CV_m (L)	Measurement of mass unevenness for cut length of 1, 3, 10, 50 and 100 m
	Deviation rate DR %	Measurement of DR of 1.5 m and 5%
	Maximum mass deviation	– m(min) = maximum mass reduction – m(max) = maximum mass increase – Possible cut length of 1, 3, 10, 50 and 100 m
	Index I	Relationship between the ideal and the actually measured unevenness of staple fibers
	Imperfections	– Counting of thin places, thick places and neps for several sensitivity levels in yarns: – Thin places: -30%, -40%, -50%, -60% – Thick place: +35%, +50%, +70%, +100% – Neps: +140%, +200%, +280%, +400% – Total imperfections available for standard (ring/air-jet yarn -50, +50, +200% and open end yarn -50, +50, +280%) and sensitive settings (ring/air-jet yarn -40, +35, +140%) and open end yarn -40, +35, +200%
	Relative count	Percentage count variation of the test material between single tests in a sample, with reference level to selectable material length

Numerical results Sensor OH	**Hairiness H**	Measurement of yarn hairiness
	Standard deviation sh	Standard deviation of yarn hairiness
	Standard deviation sh (L)	Standard deviation of hairiness for cut length of 1, 3, 10, 50 and 100 m
	Maximum hairiness deviation	– m(min) = maximum hairiness reduction – m(max) = maximum hairiness increase – Possible cut length of 1, 3, 10, 50 and 100 m
Numerical results Sensor HL	**1, 2, 3, 4, 6, 8 and 10 mm**	Individual count of fibers in each length zone, normalized to 100 m yarn length
	S3*u*	Sum of all fibers which are 3 mm and longer (cumulative), normalized to 100 m yarn length
	S1+2*u*	Sum of all fibers with the length of 1 mm and 2 mm (cumulative), normalized to 100 m yarn length
Numerical results Sensor OM – Appearance	**Diameter Ø**	Measurement of the yarn diameter over the test length
	Coefficient of variation CV2D	Determination of the cross-sectional variation of 8 mm and 0.3 mm
	Coefficient of CV FS	Relationship between cross-sectional variation of 8 mm and 0.3 mm
	Shape	Measurement of the roundness of the yarn body
	Density	Calculation of the yarn density
Numerical results Sensor OM – Twist	**T*u***	Measurement of twist in T/m and T/inch
	TM*u*	Measurement of twist multiplier in αe and αm
	ΔT*u*	Measurement of deviation of twist absolute T/m and T/inch and relative in %
Numerical results Sensor OM – Frequent Occurrences	**Frequent Occurrences**	Counting of Frequent Occurrences (FO) for several sensitivity levels in conductive yarns
	FO-	FO-: S, M, L, XL
	FO+	FO+: S, M, L, XL
	FO spots	FO spots: S, M, L, XL

Numerical results Sensor OI	**Trash and dust particles**	– Measurement of trash and dust particles – Classification of trash and dust particles according to the ITMF Definition (smaller 500 µm dust, bigger 500 µm trash)
Nummerical results Sensor FA	**Absolute count**	Absolute count in the pre-selected yarn count unit
Statistics	**Statistical values**	Overall result protocol with statistical data of the test results – Mean value – Standard deviations – Coefficient of variation CV – 95% confidence interval – USP™ (Uster Statistics percentile) – Min. value – Max. value
	Uster Statistics	– Comparison of the measured values with the Uster Statistics – Material dependent Uster Statistics chapter are stored in the data base – Possible setting of limits based on Uster Statistics
Graphic output of results: Sensors CS (1), OH (2), HL (3), OM (4) and OI (5)	**Diagram**	– Selectable ranges for x-axis and y-axis (1, 2, 4) – Cut length: normal, 1, 3, 10, 50, 100 m (1, 2, 4) – Zoom function in the single diagram (1, 2, 4) – Position of imperfections marked in the mass diagram (1) – Possibility of representing single diagram, multiple diagram and serial diagram (1, 2, 4)
	Spectrogram	– 220 channels (1, 2, 4) – Possibility of representing single spectrogram and multiple spectrogram (1, 2, 4)
	Length variance curve LVC	Possibility of representing single LVC and multiple LVC (1, 2, 4)
	Histogram	– Representing of the parameter variations in percentage (1, 2, 4) – Possibility of representing single histogram and multiple histogram(1, 2, 3, 4, 5)

Fabric simulation – Application range (Software version 1.7)

Material type	**Ring Yarn count (Ne)**	**Compact Yarn count (Ne)**	**OE Yarn count (Ne)**	**Airjet Yarn count (Ne)**
100% CO carded	Ne 12 – Ne 40		Ne 6 – Ne 32	Ne 40
100% CO combed	Ne 16 – Ne 100	Ne 20 – Ne 100		
100% PES carded	Ne 18 – Ne 40			Ne 20 – Ne 40
100% CV carded	Ne 20 – Ne 60		Ne 20 – Ne 30	Ne 20 – Ne 40
100% CMD carded	Ne 30 – Ne 80			
100% CLY carded	Ne 30 – Ne 60			
100% LI carded	Ne 6 – Ne 20			
70/30 PES/CO carded			Ne 12 – Ne 40	
67/33 PES/CO carded			Ne 12 – Ne 40	
65/35 PES/CO carded	Ne 20 – Ne 40		Ne 12 – Ne 40	Ne 16 – Ne 40
60/40 PES/CO carded	Ne 20 – Ne 40		Ne 12 – Ne 40	Ne 16 – Ne 40
52/48 PES/CO carded	Ne 20 – Ne 40		Ne 12 – Ne 40	Ne 16 – Ne 40
50/50 PES/CO carded	Ne 20 – Ne 40		Ne 12 – Ne 40	Ne 16 – Ne 40
45/55 PES/CO carded	Ne 20 – Ne 40		Ne 12 – Ne 40	Ne 16 – Ne 40
40/60 PES/CO carded	Ne 20 – Ne 40		Ne 12 – Ne 40	Ne 16 – Ne 40
35/65 PES/CO carded	Ne 20 – Ne 40		Ne 12 – Ne 40	
25/75 PES/CO carded	Ne 20 – Ne 40		Ne 12 – Ne 40	
70/30 PES/CV carded	Ne 30 – Ne 40			Ne 20 – Ne 40
65/35 PES/CV carded	Ne 30 – Ne 40			Ne 20 – Ne 40
50/50 CO/CMD carded	Ne 30 / Ne 40 / Ne 60			
45/55 CO/CMD carded	Ne 30 / Ne 40 / Ne 60			

Important Information: Fabric Simulation can not be applied to the following yarns:
Fancy yarns, core yarns, plied (folded) yarns and siro yarns

Graphic output of results: USTER® Fancy Yarn Profile	**Diagram**	– Mass diagram with slubs – Mass diagram with marked mass decreases – Possibility of representing single diagram and multiple diagram
	Scatter plot	Scatter plot sequence and frequency
	3D histogram	Representing the distribution and the frequency of the slubs
	Sequence diagram	Representing the slub length and the slub distance
	Histogram	Representing the distribution of slub length, slub distance and mass increase
	Classification	Representing the slub length and the mass increase as a numeric number in classes
	Spectrogram	– 220 channels – Possibility of representing single spectrogram and multiple spectrogram, without slubs
Data protection	**Backup**	– Automatic data backup to dedicated internal hard drive every 15 minutes – Data export to external USB or other network devices supported
Input data, output of results, languages, units	**Dialog and report languages**	English, German, French, Italian, Spanish, Portuguese, Turkish, Russian, Chinese or Japanese can be selected (other languages on request)
	Possible units	– Yarn counts: Ne, Nm, Ne_W, den, tex, dtex – Sliver counts: ktex, tex, Ne, Nm, grains/yard, g/5 m – Roving counts: ktex, tex, Ne, Nm, grains/yard, g/10 m – Speed: m/min or yd/min
	Test time	Selectable between 6 seconds to 20 minutes depending on the test mode
System security	**Protection function**	– System protected from viruses, network and other security threats – Remote support capabilities built-in – Diagnostic tools with extensive event logging – Automated system recovery

Application Software for Uster Quality Expert

Feature overview

Value Modules

- Alarm center
- Mill analysis
- Yarn prognosis
- Total Contamination Control
- Ring Spinning Optimization

Further features

- Dashboard
- Mill management

Feature short description

Alarm center

- Observes data from all production processes, analyzing it to spot deviations in quality and visualizes trends
- Differentiates between 'Alarms' due to critical quality deviations and 'Improvements' due to positive quality deviations

Mill analysis

- Combines and analyzes data from the connected instruments for data-based decisions

Yarn prognosis

- Provides an easy-to-understand grading system as basis for an accurate prognosis on the fabric appearance, pilling resistance and weaving performance

The Value Module is available if the required sensor/instrument combinations exist.

Total Contamination Control (TCC)

- Controls contamination levels in yarns with minimum waste by optimizing foreign matter ejections in blow rooms and yarn clearer cuts in winding

The Value Module is available if the required sensor/instrument combinations exist:
Total Contamination Control based on the combination of Uster Jossi Vision Shield, Uster Vision Shield Expert, Uster Quantum 3/4.0, Uster Quantum Expert.

Ring Spinning Optimization (RSO)

- Correlates intelligently ring quality data and winding quality data in a single system

The Value Module is available if the required sensor/instrument combinations exist:
Ring Spinning Optimization based on the combination of Uster Sentinel, Uster Quantum 3/4.0, Uster Quantum Expert. RSO is available for link winders only.

Reports	**Type of report**	– Fiber-to-yarn – Quality comparison – Carding/Combing efficiency – Yarn Quality – Lab utilization – Benchmark report of Total Contamination Control – Cop build-up report of Ring Spinning Optimization – Yarn prognosis – Alarm history – Alarm report – Improvement history – Improvement report – Customized reports
	Display and printout of the reports	– Reports can be printed on demand
	Limit values for the Alarm center	– Uster defined alarms, applied automatically – Setting of customized alarm sensitivity levels: close, medium or open
	Numerical results	– All numerical results are displayed as specified in each Uster instrument's individual technical data
Statistics	**Statistical values**	Overall result protocol with statistical data of the test results – Mean value – USP™ (Uster Statistics Percentile)
	Uster Statistics	– Material dependent Uster Statistics chapter are stored in the data base – Comparison of the measured values with the Uster Statistics – Classification based on Uster Statistics

Graphic output of results	**Dashboard**	Display of 6 key indicators with customizable selections. An arrow indicates the current trend of each value
	Spider chart	– Shows the product comparison based on the Uster Statistics values of selected parameters
	Bar chart	– Displays a selectable quality parameter consolidated per machine, product or lot over a configurable time period. For reference the average over previous time periods is indicated by red lines.
	Trend diagram	– Shows the trend over time for selected parameters
	TCC Benchmark	– Shows the potential of optimization in fiber clearing and winding
	Cop build-up	– Shows the speed curve of the ring spinning machine and its relation to the following: – End breaks recorded from Uster Sentinel – Relative Humidity %, Temperature recorded from Uster Sentinel – Cuts from Uster Quantum 3/4.0 – Quality parameters from Uster Quantum 3/4.0
	Lab utilization chart	– Graphical representation of utilization of each connected lab instrument in a bar chart
	Yarn prognosis	Representation of yarn grades in graphical form in a scale of 1 to 5 for – Fabric appearance with CS, OM, OH and HL sensor combination – Pilling resistance with CS, OH and HL sensor combination – Weaving performance with the instrument combination of Uster Tensojet 4/5 Uster Quantum 3/4.0 via Uster Quantum Expert (only possible with capacitive basic clearing, Foreing-Matter/Vegetable-Matter and advanced classification of Uster Quantum 3/4.0 clearers)

Uster Grades – Application range (Software version 3.0)

	Grade for Fabric Appearance				Grade for Pilling Resistance				Grade for Weaving Performance			
Material type	Ring	Compact	Rotor	Airjet	Ring	Compact	Rotor	Airjet	Ring	Compact	Rotor	Airjet
100% CO carded	•		•		•		•		•			
100% CO combed	•	•		•	•	•			•	•		
100% PES carded	•		•	•	•		•	•	•			
100% CV carded	•		•	•	•		•	•	•			
100% CMD carded	•	•			•	•			•	•		
100% CLY carded	•				•				•			
100% LI carded	•				•							
20–65 / 80–35 PES/CO*	•				•							
35–55 / 65–45 PES/CO*		•				•						
25–70 / 75–30 PES/CO*			•				•					
35–70 / 65–30 PES/CO*				•				•				
15–80 / 85–20 PES/CO*									•	•		
45–55 / 55–45 CO*/CMD	•	•			•	•				•		
48–60 / 40–52 CO*/CMD									•			
55–75 / 45–25 PES/CV	•				•							
45–75 / 55–25 PES/CV				•				•				
50–90 / 50–10 PES/CV	•								•			

*Applies for carded/combed Cotton.

Important Information: Uster Grades cannot be applied to the following yarns:
Fancy yarns, core yarns, plied (folded) yarns and siro yarns

Alarm report

- Display of alarm summary per product step
- Acknowledged
- Done
- Alarm summary over time
- Alarm summary by product
- Alarm summary per machine

Improvement report

- Improvement summary over time
- Improvement summary by product
- Improvement summary per machine

Data connection	**Instrument**	– Uster Afis Pro 2 – Uster Tester 5 – Uster Tensojet 4/5 – Uster Tensorapid 4/5 – Uster Jossi Vision Shield 2/T via Uster Vision Shield Expert – Uster Sentinel – Uster Quantum 2/3/4.0 via Uster Quantum Expert
	Backup	– Automatic data backup to dedicated internal hard drive every 15 minutes – Data backup to external USB or network devices supported
Input data, output of results, languages, units	**Dialog and report languages**	English, German, French, Italian, Spanish, Portuguese, Turkish, Russian, Chinese, Japanese or Vietnamese
	Possible units	– Yarn counts: Ne, Ne_L, Nm, Ne_W, den, tex, dtex – Roving counts: g/10 m, grn/yd, ktex, tex, Ne, Ne_L Nm, Ne_W – Sliver counts: g/5m, grn/yd, ktex, tex, Ne, Ne_L Nm, Ne_W – Fiber length: mm, inch – Twist: T/m, T/inch, T/10 cm, TM Twist multiplier (alpha m), alpha m, alpha e – Force: cN, N, daN, gf, kgf, lbf, ozf – Tenacity: cN/tex, N/tex, cN/dtex, gf/denier, Rkm, kgf*Ne, kgf*Ne_L, kgf*Ne_W, lbf*Ne, lbf*Ne_L, lbf*Ne_W, ozf*Ne, ozf*Ne_L, ozf*Ne_W – Work: cN*cm, N*cm, gf*cm, kgf*cm, lbf*cm, ozf*cm
System security	**Protection functions**	– System protected from viruses, network and other security threats – Remote support capabilities built-in – Diagnostic tools with extensive event logging – Automated system recovery

Installation conditions

General ambient conditions	**Room climate**	The ambient conditions must be maintained in order to avoid any influences on the test material according to ISO 139 (2011). – Humidity: 65±4% – Temperature: 20±2 °C Standard atmospheres
Installation	**Electronical connections**	Single phase with protective conductor
	Mains voltage range	100 – 240 VAC
	Mains frequency	50/60 Hz
	Power consumption	Max. 1,000 VA
	Compressed air connection	– Air quality: according to ISO 8573.1, class 3 – Connection: – Min. pressure at inlet of air filter regulator: 6 bar – Max. pressure at inlet of air filter regulator: 10 bar – Requirement compressed air: Standard – S800 Automatic: 12 m^3/h – S800 with Module FA: 18 m^3/h – S800 Semiautomatic: 9 m^3/h – Min. internal diameter of the connection: 8 mm – Max. length of the connection: 5 m – Max. temperature difference between compressed and laboratory air: 10 °C
Gross weight of the basic function	**Semi-automatic version**	– Test unit: 60 kg – Furniture: 118 kg – Complete system: 208 kg
	Automatic version	– Test unit: 78 kg – Furniture: 118 kg – Sensor FA: 24 kg – Complete system: 249 kg

Uninterrupted power supply (UPS)

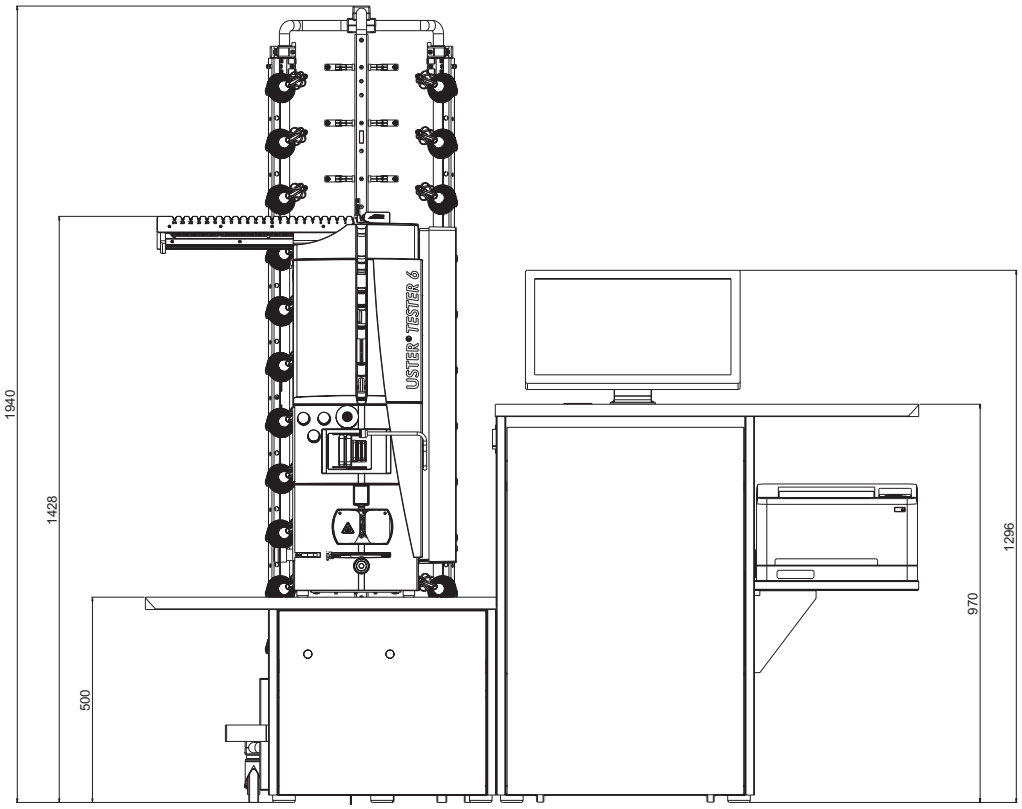
UPS must be provided by the customer

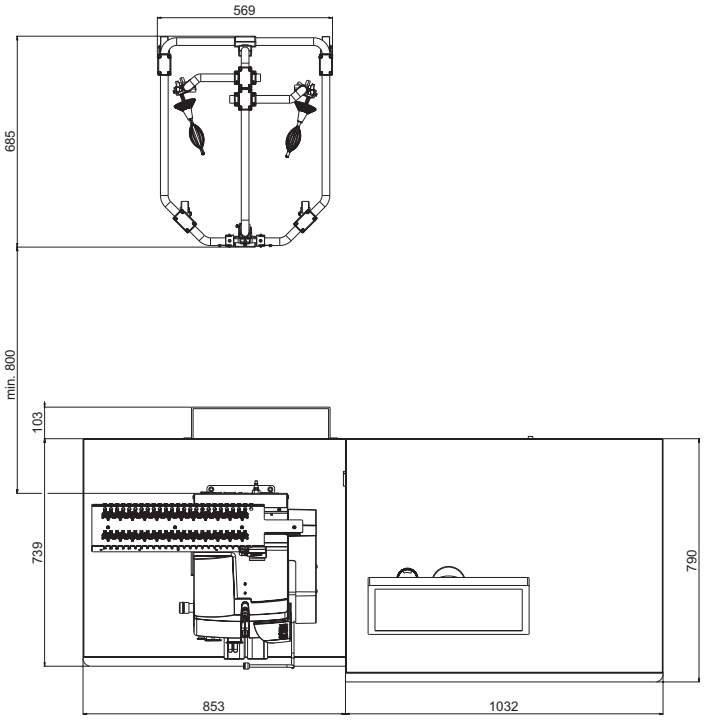
	UPS Model	Tower
	UPS Bypass Type	ON-Line
Electrical Input	**Nominal Voltage**	120 VAC, 220 – 240 VAC
	Voltage range 120 VAC	90 – 138 VAC
	Voltage range 230 VAC	160 – 276 VAC
	Frequency	50/60 Hz
Output	**Nominal Output Voltage**	120 VAC, 230 VAC
	Power Capacity	1,000 VA (1 kVA)/900 W
	Voltage regulation	+/-3%
Enviroment	**Safety markings 120/208 V**	UL, CUL, VCCI
	Safety markings 230 V	CE, GS
	Ambient operating temp.	Laboratory condition are acceptable
	Relative humidity	Laboratory condition are acceptable

Note: It is not permitted to connect a Laser Printer.

Space required for the installation of Uster Tester 6-S800/A

– At a vibration free location





Uster Technologies has made all possible efforts to ensure that all information is accurate at the time of publication. Hereby it is declared that alterations to the product may be possible at any time. In these cases the information contained in this technical datasheet is subject to change without notice.

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