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OPTIPAC® VMC-12

Modular process control system

Permaset VMT
dwell time

Famacont PMC
thread count

Gravimat FMI
grammage (G/m²)

Ecomat AML
exhaust air humidity

OPTIPAC® VMC-12

Quality made in Germany

bluesign® SYSTEM PARTNER

TEXTIL NONWOVEN PAPIER KUNSTSTOFF

OPTIPAC® VMC-12

A modular system for measuring, logging and controlling critical process parameters such as dwell time, thread density, residual moisture, m²-weight, etc. across the full width of the product, and exhaust air humidity.

Applications

Cost-effective and quality-conscious textile finishing is primarily an operational matter. More often than not, however, it determines quite simply the extent of market participation. Globalisation of the markets allows production capacity to flourish wherever standards in terms of price and/or quality can best be met. Furthermore, it often requires a much greater degree of flexibility in long-term planning and product lines.

In order to assist quality-conscious textile finishers, Mahlo® pursued the idea of combining the most important process parameters in a modular concept by designing and manufacturing Optipac VMC-12, a modular process control system for use on stenters and many other finishing ranges. Given that there was already a latent need to monitor various process variables, the concept of combining multiple devices in a single aggregate simply makes sense and is more cost-effective than by stringing together individual appliances. It also takes into account limited investment budgets by providing the option of cost-effective expansion to meet changing needs and/or improving financial situations.

Product-highlights

- ✓ Modular system architecture
- ✓ Easy to retrofit
- ✓ Operator-friendly
- ✓ Informative process visualisation
- ✓ Online monitoring and control of all relevant parameters

Principle of operation

The Optipac is a modular system for monitoring and controlling a variety of essential parameters in textile finishing. It takes advantage of the savings potential resulting from alternative and/or parallel use of common components.
Various intelligent sensors can be connected to the base unit's processing electronics via a CAN bus link. A 15" touchscreen is used for visualising measurement-related data. A switching option allows the user to bring the application of interest to the screen's foreground and to be warned of any existing alarm condition in the background application. It is a simple matter to customise readouts into combined displays, thereby enabling the operators to monitor the entire process at a glance.

Specifically, on stenters or other production ranges, a VMC can measure, visualise, control within the limits of the manipulated variables, and document with the help of special software packages (print server):

- Liquor pick-up/padding bowl nip pressure
- Thread and course count/overfeed
- Exhaust air humidity/exhaust fan speed or damper opening
- Surface temperature/product line-speed and dwell time
- g/m2 weight/overfeed
- Residual moisture/product line-speed
- Stretch and shrinkage/overfeed
- Product width
- Product temperature profile cross-web/product line-speed
- Residual moisture profile cross-web/product line-speed

Customer benefits

- ✓ Increased productivity
- ✓ Optimised quality assurance
- ✓ Optimised process repeatability
- ✓ Documentation and comparability of quality
- ✓ Considerable energy savings
- ✓ Short payback times

CONTENTS

BASIS

SENSORS

TECHNICAL DATA

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TEXTILE NONWOVENS PAPER PLASTIC

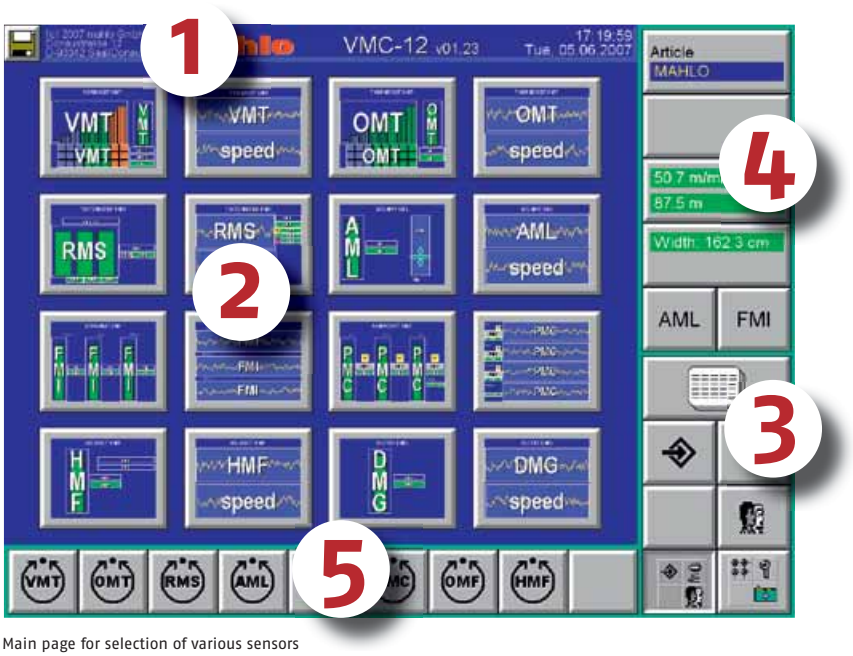
BASIS

VISUALISATION

EVERYTHING AT A GLANCE

Product-highlights

- ✓ Simultaneous management of various sensors
- ✓ Freely scalable trend diagrams
- ✓ Variable image scaling on histograms
- ✓ Password protection: unauthorised users are denied access to the program
- ✓ Recipe management
- ✓ Integrated audio response



Main page for selection of various sensors

Customer benefits

- ✓ Menu prompt in all common languages
- ✓ Ergonomic user prompting
- ✓ Easy to operate

The user interface is divided into five sections:

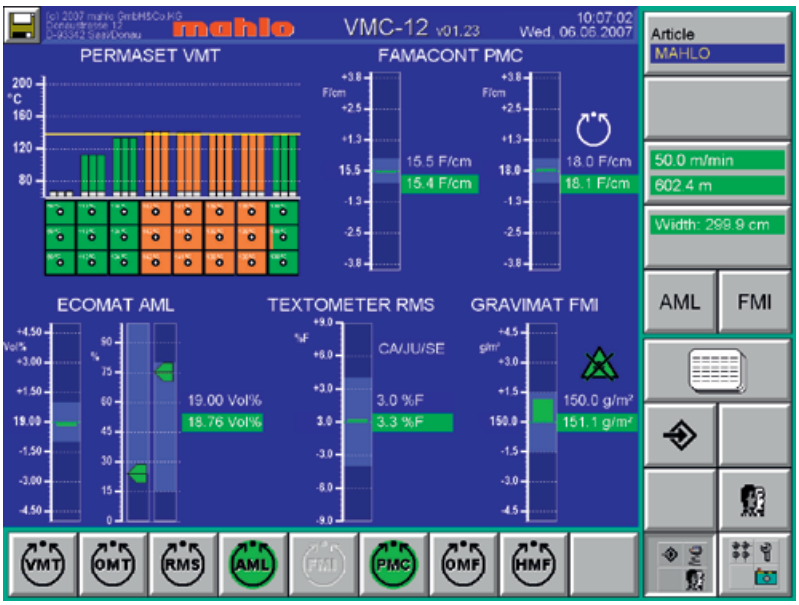
1. Title line:
General information (including alarm bar)

2. Display area:
Selectable screen pages (display forms)

3. Selection block:
Navigation within the program

4. Vertical block:
Touch buttons for main options

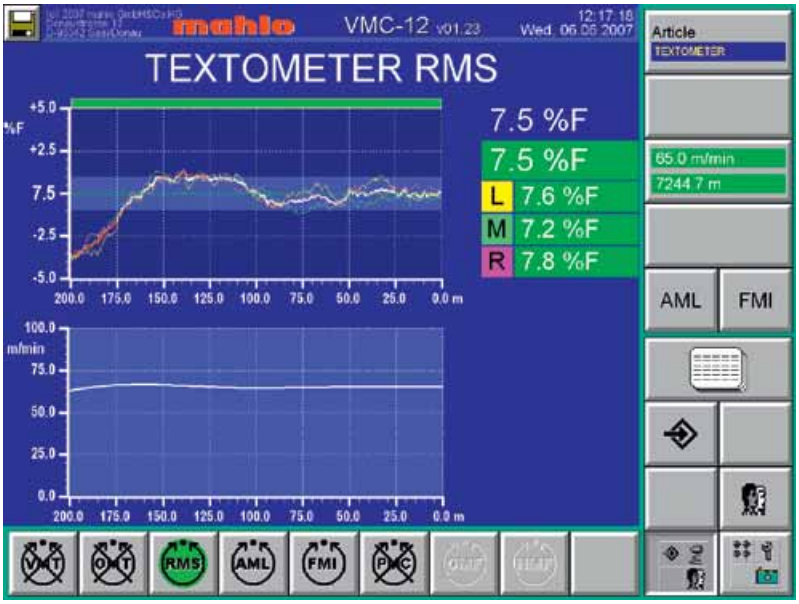
5. Horizontal block:
Touch buttons for basic functions and sub-options



Display of values from various process control sensors

COMMUNICATION

Our systems talk to you. The touchscreen operated "Human Machine Interface" uses the integrated audio-response facility to give you information on product quality and adherence to tolerances. In any language you wish. So you always know what's happening.



Trend graph for residual moisture and line-speed

The use of touchscreen technology eliminates mechanical elements such as keys and switches. Everything is entered directly via the screen through large-size, ergonomic buttons. Audio response in the user's own language represents a huge leap in user-friendliness. Operation of the interface is simple and intuitive. All essential information is visible at a glance.

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PERMASET VMT

DWELL-TIME CONTROL

Maximum process efficiency and a top-quality product require as an absolute must reliable control of dwell-time. In that respect, Permaset VMT has a great deal to offer.

Product-highlights

- ✓ Non-contact measurement of product temperature
- ✓ High-temperature proof sensors
- ✓ Low maintenance requirements
- ✓ Easy to install
- ✓ Self-cleaning sensors

Customer benefits

- ✓ Maximum repeatability
- ✓ Optimal utilisation of stenter capacity
- ✓ Low energy consumption per meter of product
- ✓ Ultra-reliable processing
- ✓ Short payback times
- ✓ Elimination of safety margins

Applications

Without being aware of what's happening in the drying bays during a heat-setting, thermosoling, curing or gelling process, a stenter has to be regarded as a "black box". The user has only his own experience to fall back on. Settings for circulating- air temperature and stenter speed have to be determined empirically. To ensure that fabric is adequately set, most finishers run their stenters at speeds which allow for a considerable margin of error, speeds far removed from those that would exploit to the full the capacity of the machine and energy used for drying and setting.

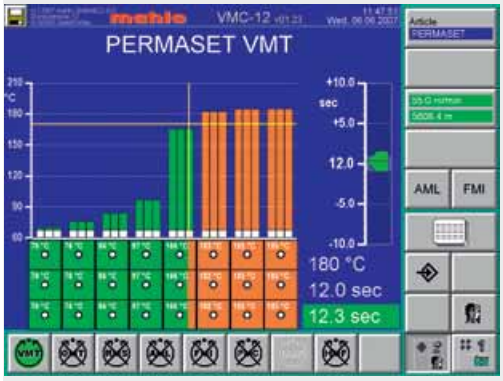
On many processes, knowledge of what happens in the stenter is not just a question of economics. The achievable finished quality also depends heavily on suitable temperatures and dwell times, e.g. the heat-setting of textiles with a Lycra component. Excessive temperatures could result in the Lycra having to sacrifice its elasticity, a loss that would impair the quality of the product considerably.

To ensure reproducible processing, the use of appropriate monitoring techniques in the drying bays is an absolute must.

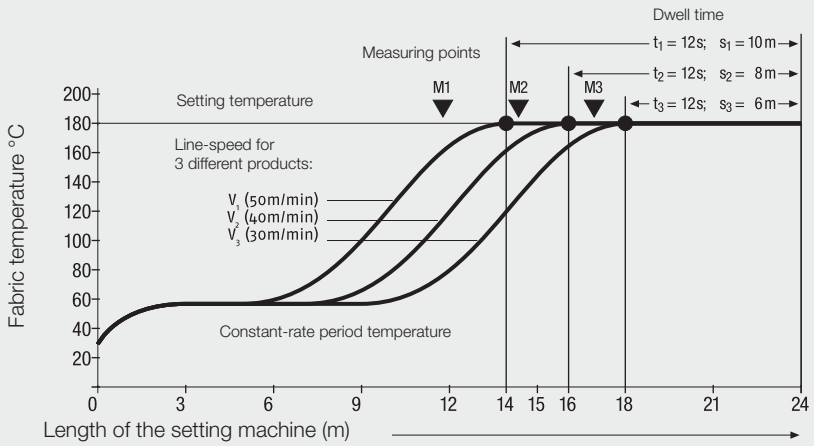
Principle of operation

When wet fabric enters a dryer, it first heats up to a level known as the constant-rate period of drying. Once the water content drops to residual moisture levels, the temperature of the product begins to rise again. The closer its temperature approaches that of the circulating air in the dryer, the slower the temperature continues to rise. At a certain temperature threshold – the so-called fixing temperature – the material is hot enough to be adequately processed, heat-set or cured. To determine dwell time at the requisite product temperature, the surface temperature of the web is measured at several points along the dryer by non-contact, high-temperature proof HP250 infrared pyrometers. Permasets infrared pyrometers can also be arranged across the width of the product (left, centre, right). The system uses the trend of the rising temperature curve to determine the exact

point where the target heat-setting temperature has been reached. Depending on the product's properties (material composition, weight, incoming moisture content) this temperature is reached at different points along the dryer, consequently, several sensors are required (normally 3 to 8, but up to 64) to ensure sufficient definition of the temperature trend. If line-speed is known, it can be used to determine and thereby control the time during which the product is subjected to a preset temperature. In addition to the qualitative aspect of reproducibly maintaining to a great extent constant processing conditions, productivity can also be consistently increased and energy consumption optimised, since the finisher no longer has to rely on safety margins. The increase in productivity experienced in practice can be anything up to 30 %, and depends on the commodity, piece length and previous efforts to optimise the process.



Temperature profile along the length of a stenter



DWELL TIME

Automatic control allows the dwell time of the product to be precisely monitored in the stenter

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FAMACONT PMC

CONTROL OF PICK AND KNITTED COURSE COUNT

Continuous and precise determination of the density of picks or knitted courses is an important factor in any effort to optimise the quality of the product during a textile finishing process.

Applications

The Famacont PMC is a reliable instrument which counts continuously the number of weft threads or knitted courses per unit length in order to check essential parameters such as the weight, stretch or shrinkage of a fabric. The Famacont PMC is thus an important tool to enable finishers to maintain the quality specifications of their customers and reduce the costs arising from rejects and impaired quality.

Famacont is a versatile tool; it is used for the most part on stenters and in conjunction with shrinking machines and compactors.

Product-highlights

- ✓ Non-contact and continuous counter
- ✓ Determines thread or knit course density with the utmost accuracy using digital signal processing
- ✓ Uses "smart" algorithmic feed forward control
- ✓ Can be used almost anywhere

Customer benefits

- ✓ High repeatability
- ✓ Consistent residual shrinkage
- ✓ Homogenous appearance of product
- ✓ Documentation of product quality
- ✓ Short payback times

Principle of operation

The Famacont PMC determines thread density by means of a non-contact type, optoelectronic device. The individual threads passing the sensor are projected onto a photocell via a precision lens. Depending on the type of fabric, the scanner can be made to respond to back or incident light. The resultant frequency is proportional to thread count. The signal is amplified, processed and digitally analysed by a microprocessor. The resultant thread count is displayed on a screen. The progressive thread density over a preset period of time is also indicated continuously on a trend graph.

Scanner on the Famacont PMC

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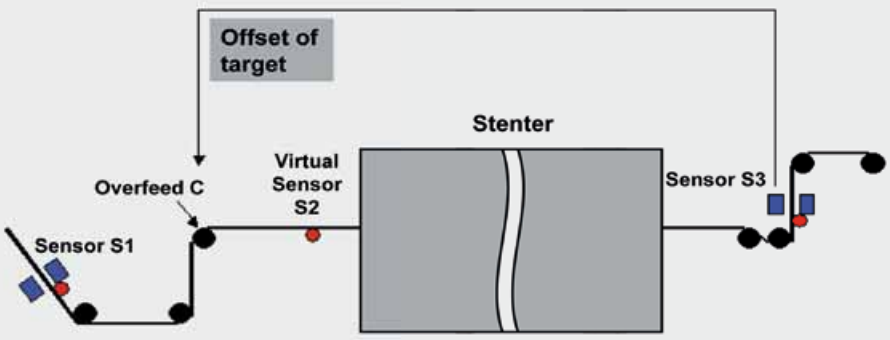
Control strategy:
A clever algorithmic feed forward controller and two scanners ensure outstanding results on stenters. By optimising the target count for pick and course density, a homogenous product and consistent residual shrinkage are achieved. Even with brief variations in thread density, the target count is immediately adjusted to the actual value as soon as the product arrives at the stenter in-feed. By automatically rechecking the result at the delivery end, the PMC makes an additional fine-adjustment to the preset target at the in-feed end.

The count sensor at the stenter in-feed is in most cases built into an RFMC straightener by way of an additional scanner, thereby avoiding the extra costs entailed by fixing it separately. If required, an additional scanner can be wired in to check thread count at both the feed and delivery end of a dryer. The supports and guide plates supplied facilitate installation of the scanner and light source even if space is at a premium.

If required, a printer package can be used to document process statistics. Data can be sent to host computer systems via a host computer port.

Thread density display

Trend display for thread density



SMART FEED FORWARD CONTROL

In order to achieve a homogenous product and an increase in output, a Famacont PMC controls +/- overfeed fully automatically.

SENSORS

TEXTILE NONWOVENS PAPER PLASTIC

GRAVIMAT FMI

MEASUREMENT OF G/M² WEIGHT

This monitoring and control gauge measures weight per unit area continuously, non-destructively and online.

Applications

Precise online monitoring of the weight per unit area of webs on many processing lines in the textile and coating industry is used as a means to determine that vital criterion in the assessment of quality. The important thing is to measure the weight online under the given industrial conditions and with a high degree of repeatability.

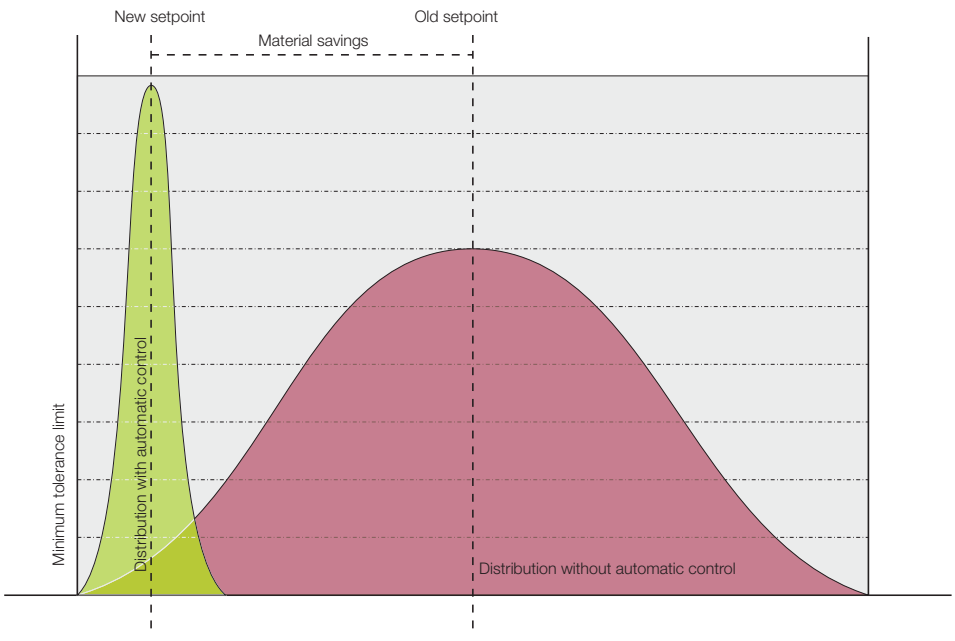
In addition to ensuring product quality, by setting an appropriate target weight with tightly selected tolerances, considerable savings in material and energy consumption can be achieved along with an increase in productivity and the reliability of the process (see graph).

Product-highlights

- ✓ Excellent repeatability of the measured values
- ✓ Non-contact measurement
- ✓ Digital signal processing
- ✓ Integrated temperature compensation
- ✓ Integrated source decay compensation
- ✓ Integrated air gap compensation

Customer benefits

- ✓ Material savings
- ✓ Quality assurance
- ✓ Increased productivity
- ✓ Comprehensive quality documentation



RELIABILITY
Our machines do exactly what we build them for: hour after hour, year after year. Our design team ensures that the central nervous system of our equipment always works without interruption. So that you always reach your objective.

Principle of operation

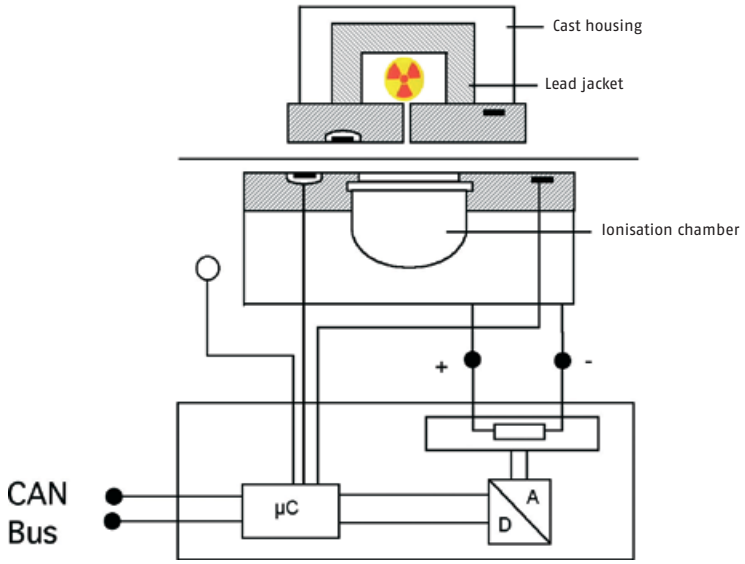
Weight is measured continuously, without physical contact and with the utmost accuracy. Within the usual range of textile weights, measurement relies on the attenuation of radioactive radiation as it passes through the substrate in the measuring gap. This attenuation in intensity is a measure of the g/m² weight of the product.

Specially designed and patent-applied-for compensation procedures eliminate undesirable effects and result in the highest possible degree of accuracy.

Various nuclides are available to cater for a wide variety of weights such as that of pile carpeting or coated textile substrates. To check a coating process for example, the product can be measured at two places in order to obtain a differential measurement.

Trend display for weight per unit area measurement

Block diagram of the sensor



SENSORS

TEXTOMETER RMS

RESIDUAL MOISTURE CONTROL

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Economical drying means using a minimum of energy to achieve a consistent percentage of residual moisture by continuously monitoring and controlling the drying process.

Product-highlights

- ✓ Measurement of even low percentages of residual moisture
- ✓ Excellent repeatability
- ✓ Maintenance and trouble-free
- ✓ Variety of electrodes for different applications
- ✓ Optionally, it can also determine % age regain at the left, centre and right of a web

Customer benefits

- ✓ Higher productivity and better quality
- ✓ Optimal residual for further processing
- ✓ Optimal use of drying capacity
- ✓ Short payback time
- ✓ More profitable returns
- ✓ Energy savings per meter of product

Applications

One of the most important criteria in the course of a drying process is product moisture retention. The correct degree of residual moisture is of prime concern: it determines to a great extent the efficiency of every drying process as well as the quality of the product and/or subsequent finishing.

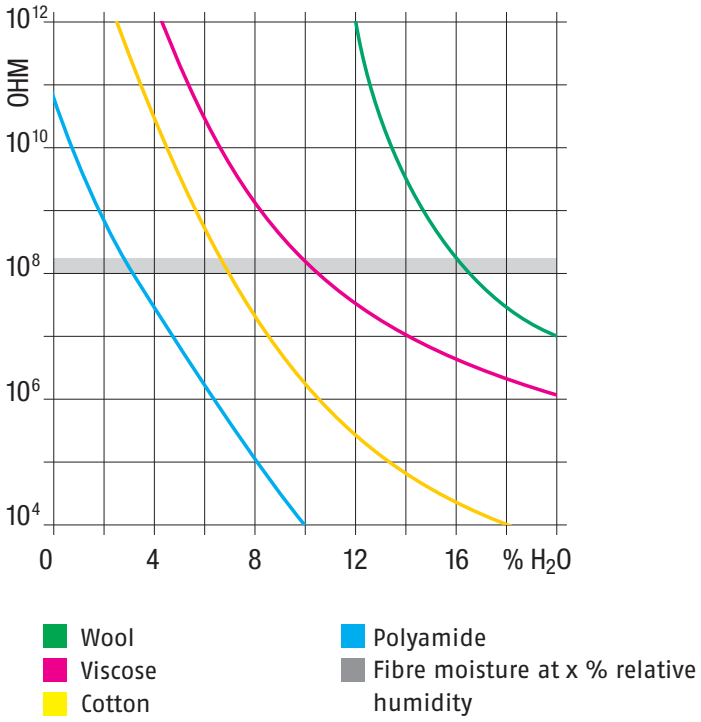
The over-drying of textiles must be avoided since this usually has a negative effect on product appearance and feel. Drying to below the hygroscopic moisture equilibrium results in a reduction in weight and consequently diminished returns. If the textile is over-dried in a stenter, it results moreover in an enormous reduction in the machine's capacity to dry, as the dryer is being run at a speed far below what it is capable of.

Principle of operation

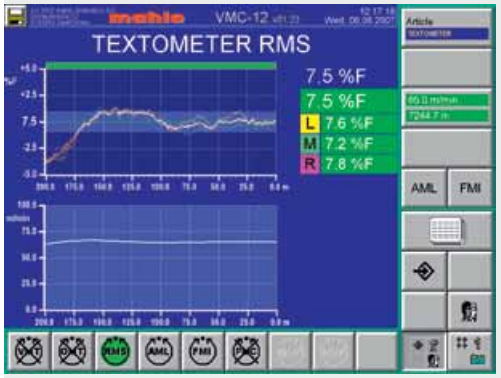
Of the electrically measurable properties of textiles at residual moisture levels, conductivity is the one most heavily dependent on the water content of the textile substrate. Moisture variations of just a few percent change the conductivity by the power of ten; water content and electrical conductivity of cellulose-based materials are linked with each other by an exponential function. Within the residual moisture range, neither the weight of the product nor the nature of the water, neither the thickness of the material nor the liquor composition have anywhere near the same powerful influence on electrical conductivity as the quantity of water in the commodity.

With most material compositions, residual moisture can be readily determined by direct measurement of their electrical conductivity. A particular advantage of this method is that different textiles exhibit specific but dissimilar percentages of moisture regain at the same level of electrical conductivity. The individual calibration curves related to the various material compositions are already stored in the system.

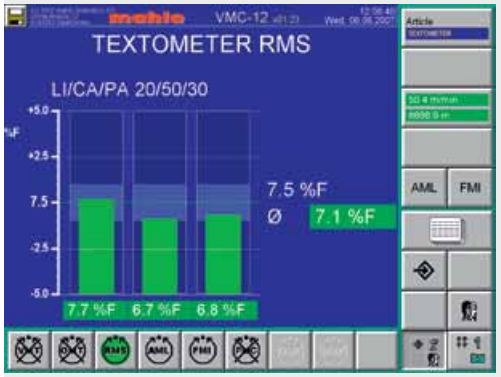
The electrical resistance is measured between 2 poles of an electrode. Depending on the requirement this can be configured in various ways (e.g. between the electrode and a counter-roller, 2 rollers insulated from each other, etc.).



Calibration curves for various types of fibre



Trend display for residual moisture measurement



Display of moisture at left, centre and right

Textometer RMS in use

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ECOMAT AML

MAXIMUM MEASURING ACCURACY. OPTIMAL ENERGY BALANCE

On dryers lacking a suitable control facility, a considerable amount of unused energy is exhausted into the atmosphere. The Ecomat AML restricts energy consumption to the actual amount required to dry by measuring the quantity of water vapour in the exhaust air and controlling the speed of an extractor fan or setting of exhaust dampers accordingly.

Applications

Huge amounts of hot air are used to continuously evaporate fresh amounts of water (moisture), and transport the resultant mixture of hot air and water vapour out of the dryer. The ratio between the two has an appreciable impact on the overall efficiency of the drying process.

The amount of water to be evaporated during any given period of time changes constantly in accordance with the weight of the product, incoming and residual moisture, product width and line-speed. A constant exhaust fan speed and/or exhaust air damper setting can in no way provide the maximum benefits in terms of energy conservation and efficiency. Rather, the humidity of the exhaust air needs to be constantly measured and the exhaust duct's fan or dampers need to be controlled automatically to bring about these benefits.

Product-highlights

- ✓ Highly accurate measurements
- ✓ Unaffected by carrier gases
- ✓ Output data on proportion of oxygen, water vapour and harmful gases
- ✓ Maintenance-friendly
- ✓ Self-cleaning
- ✓ Rugged construction
- ✓ Zirconium-oxide sensor

Customer benefits

- ✓ Optimises energy balance
- ✓ Saves energy
- ✓ Increases process repeatability
- ✓ Improves quality
- ✓ Short payback time

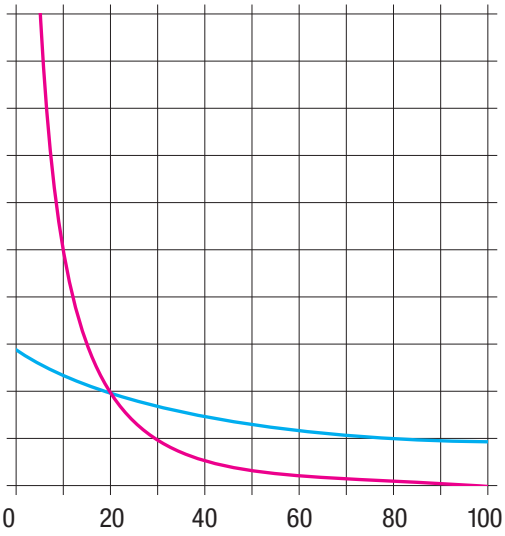
Principle of operation

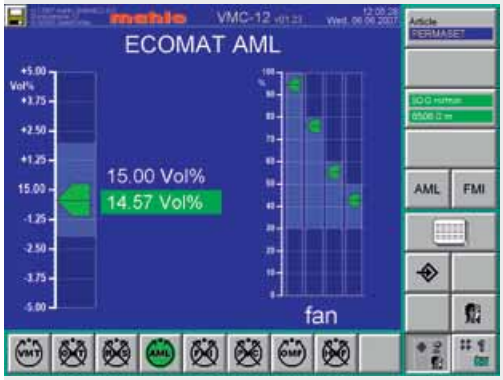
To measure exhaust air humidity Mahlo® uses a zirconium-oxide probe which determines exactly the content of water vapour and oxygen, regardless of the presence of other gases or harmful vapours. It does so by applying a specific voltage to ionize both the elemental oxygen and that combined with the water vapour. The proportion of oxygen to steam is then determined by the resultant current. The sensor is heat-proof and features a kind of self-cleaning facility, since any accumulation of residues or organic substances on the heated measuring cell are immediately burned off. This feature virtually

Typical sensor installation

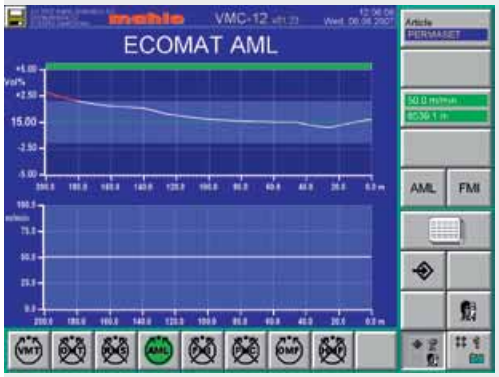
ensures a maintenance-free sensor. The control signals are used to regulate frequency-controlled exhaust fans or damper positioning drives, and the software is programmed for up to 4 control outputs for fans or exhaust dampers. The absolute humidity measurements can be indicated in g/kg, °C dew point, or vol. % of H_2O.

The graph shows to what extent the cost of heating a dryer is dependent on the requisite volume of fresh air and thus the vapour content in the exhaust air. Whereas the evaporative efficiency curve is relatively flat, the cost index curve rises quite sharply, particularly when the exhaust dampers are left wide open and the resultant content of water vapour is low. Fan speed should be set such that the humidity in the exhaust air is as high as possible without noticeably reducing product throughput.





Setpoint/actual display



Exhaust air humidity trend display

KNOWLEDGE

We have a common goal: maximum performance from your appliance. To that end we are at your side, right from the installation of the appliance and advice on how to maintain it through to the training of your employees. Our instructors get your people in shape in matters of operation and maintenance. So that you can solve problems even faster.

SENSORS

TEXTILE NONWOVENS PAPER PLASTIC

WILOT WMR

MONITORS PRODUCT WIDTH

Product-highlights

- ✓ Non-contact and continuous
- ✓ Digital signal processing helps it determine product width with the utmost accuracy
- ✓ Universal application

Customer benefits

- ✓ High standard of repeatability
- ✓ Homogenous product appearance
- ✓ Documentation of product quality
- ✓ Short payback time

Applications

The Wilot WMR is a reliable instrument for non-contact, continuous measurement of product width, especially at the delivery end of a stenter. A Wilot WMR helps finishers to maintain the quality specifications of their customers and minimise the costs incurred by rejects and impaired quality standards.

The Wilot system is versatile; its chief areas of application are on stenters and levelling tenters.

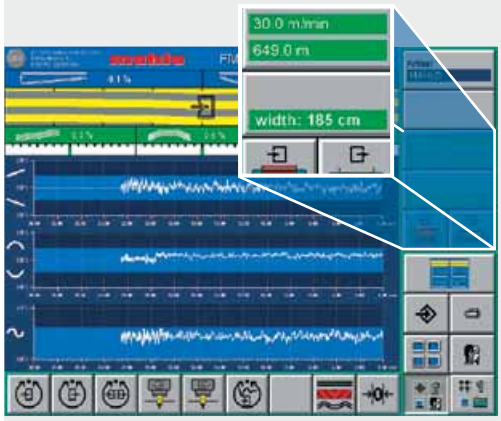
Control and display module

Principle of operation

IR-LEDs in reflex mode determine product width. The operator can adjust the sensitivity of the sensors at the control panel supplied, and specify maximum and minimum permissible product width for alarm functions. Since the sensor module is arranged on one side only of the online material, it is most flexible in terms of choice of location.

The unit consists of:

- sensor module
- electronics
- control panel
- digital display (optional)



Product width displayed on an Orthopac screen

2 models are available to cover a wide variety of applications:

- stand-alone version with digital indicator
- modular version together with an Orthomat and visualisation on a TFT touchscreen.

Quality made
in Germany

For decades we have been designing and making our appliances exclusively in Germany – using the highly motivated specialists we have trained ourselves. This is your guarantee of the highest level of quality.

60 1945 2005 YEARS MAHLO

SENSORS

TEXTIL NONWOVEN PAPIER KUNSTSTOFF

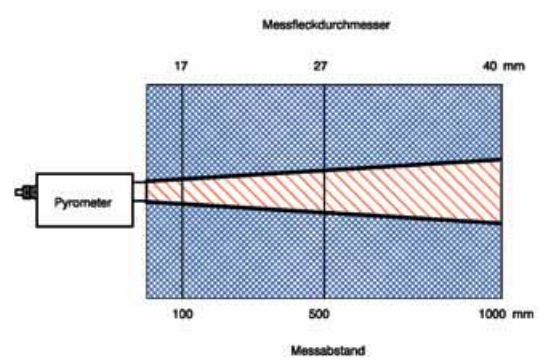
THERMOSCAN OMF

TEMPERATURE PROFILE

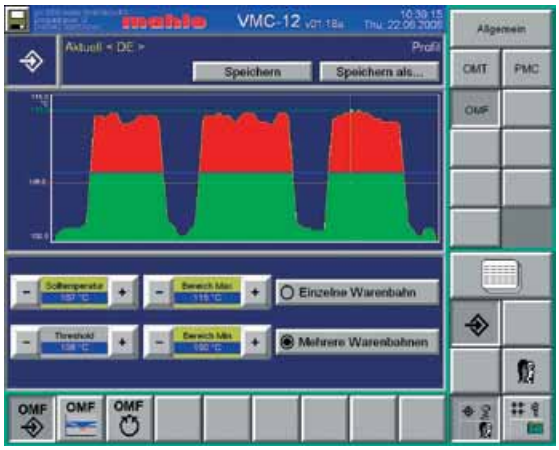
Applications

Tubular fabric is generally dried in multiple adjacent lots, without tight-strand fabric guiding, or lengthwise tension, and with various numbers of lots and correspondingly unequal distances between the tubes. The g/m² weight and incoming moisture content of the individual lots may also differ from each other. Control of residual moisture must therefore take into account all the adjacent lots and calculate from those the optimal drying conditions. A Thermoscan prevents inadequately dried or over-dried tubular fabric. This in turn improves product quality and the dryer is used most efficiently and with a minimum of energy. Thermoscans can also be used to great advantage on such as single open-width webs where only the temperature profile across the width is of interest.

Thermoscan OMF measuring field



Thermoscan OMF at a dryer's delivery end



Main display showing temperature profile

Principle of operation

The temperature of the product at the dryer outlet depends on the amount of moisture it retains. Measurement of product temperature thus provides information on residual moisture. Thermoscan monitors the temperature of the product without touching it, and regardless of distance or colour, with a heat-radiation sensitive sensor (pyrometer). The radiation pyrometer runs to and fro across each web and records the temperature from one edge to the other. The spaces between the tubular lots are blanked out automatically, so that the temperature of the background is not taken into account.

The measured values are processed continuously, and Thermoscan indicates the average, minimum or maximum temperatures. For control of moisture, and depending on the requirement, one of these temperatures is used as the instantaneous value and compared with the set-point target. The speed of the machine is then adjusted accordingly.

LISTENING

Our sales team knows how to listen: with our customers' requirements, wishes and ideas firmly in mind, they point our R&D engineers in the right direction. So you get exactly what you really need.

Product-highlights

- ✓ Traversing radiation pyrometer
- ✓ Non-contact measurement of product temperature
- ✓ Monitors the temperature from one edge of the product to the other
- ✓ Measures multiple adjacent webs simultaneously

Customer benefits

- ✓ Optimises the drying process
- ✓ Increases processing capacity
- ✓ Saves energy
- ✓ Short payback time

TEXTILE NONWOVENS PAPER PLASTIC

ELOTEX DMG

DETERMINING PRODUCT STRETCH/SHRINKAGE

Product-highlights

- ✓ Non-contact and continuous measurement
- ✓ Determines by means of digital signal processing stretch or shrinkage with the utmost accuracy
- ✓ Can be used virtually any where

Customer benefits

- ✓ High standard of repeatability
- ✓ Homogenous product appearance
- ✓ Documentation of product quality
- ✓ Short payback time

Applications

The Elotex DMG is a reliable instrument for non-contact, online determination of product stretch and shrinkage. The Elotex DMG is thus an essential tool for finishers, as it helps them maintain the quality standards required by their customers and reduce to a minimum the costs incurred by rejects and impaired quality.

The Elotex system is versatile; it is chiefly used on stenters and shrinking or compacting machines.

Pulse generator

Functional principle

An Elotex DMG determines product stretch or shrinkage by using two passage counters, one each at the feed and delivery end of a stenter. The product runs over the two counters and the measured lengths are compared with each other to form a differential. Stretch or shrinkage is given in percent and displayed on the Orthopac's touchscreen. The progressive amount of stretch or shrinkage is indicated continuously over a preset period of time on a trend graph

The supports and guide plates supplied facilitate installation even when space is at a premium.

Product width displayed on the Orthopac screen

Stretch/shrinkage trend diagram

PROMPT INSTALLATION

Our service team ensures that the installation of our appliance runs smoothly and on-time. So that your investment is turned quickly into profit.

SENSORS

TEXTODRIVE TMS

MOISTURE PROFILE

TEXTILE NONWOVENS PAPER PLASTIC

Applications

The correct % age of residual moisture is of prime concern during a drying process: it determines just how efficiently the dryer is being used. However, the amount of residual moisture often has a major influence on the quality of the product and during subsequent processing.
Many textile processors require as a basic prerequisite a uniform distribution of moisture across the width of the product to ensure that it is finished properly following a drying process.

Typical applications:
- wetting processes
- pre-treatment prior to printing
- pre-treatment prior to dying

Textiles often need to be rewetted as evenly as possible, as the cross-web distribution of moisture is also of importance to subsequent finishing.

Typical applications:
- prior to sanforizing
- rewetting after a drying process, etc.

Product-highlights

- ✓ Unique ball-type sensor with traversing mechanism
- ✓ Uncomplicated sensors
- ✓ Corrosion-proof stainless steel assembly
- ✓ Constant electrode pressure regardless of the thickness of the product
- ✓ Proven, robust and fault-immune electronics

The traversing ball sensor

DEVELOPMENT
To ensure high-performance capability of and maximum customer benefit from our products, we use the very latest technologies and a strong commitment to develop the products of tomorrow. So that the future can start for you today.

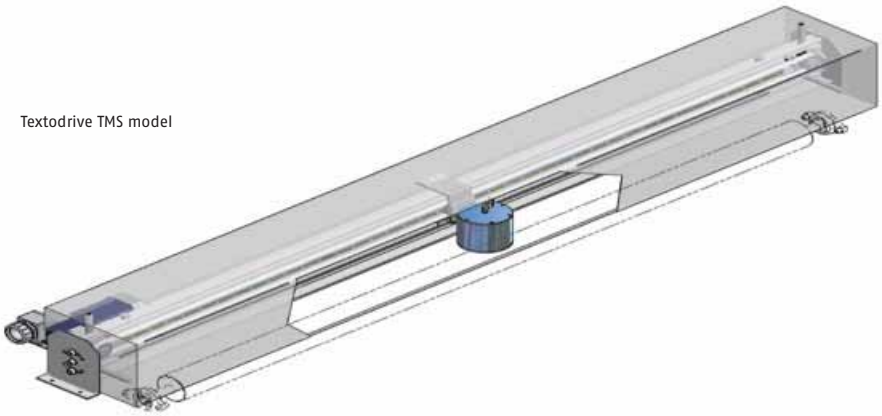
Principle of operation

A Textodrive TMS measures the conductivity and thus the residual moisture content of the product using a surface contact ball sensor. The latter runs continuously to and fro across the web and records the moisture profile from one edge of the product to the other. The sensor's air cushion ensures an adequate but gentle degree of contact to the product, so that no permanent marks are left on it. It also compensates for any variations in product thickness or for example seams and provides a self-cleaning facility for the sensor.

Single-sided measurement allows a high degree of flexibility in respect of mounting options and simple product feed-through. Whilst the product is being threaded in, the sensor is simply moved to the parking position at the end. A Textodrive TMS provides precise measurements thereby ensuring an economical use of energy and a reduction in sub-standard products.

Customer benefits

- ✓ Moisture profile measured across the entire width of the product
- ✓ Optimal residual moisture for subsequent finishing
- ✓ Short payback time
- ✓ Broad spectrum of optional applications
- ✓ Easy to install

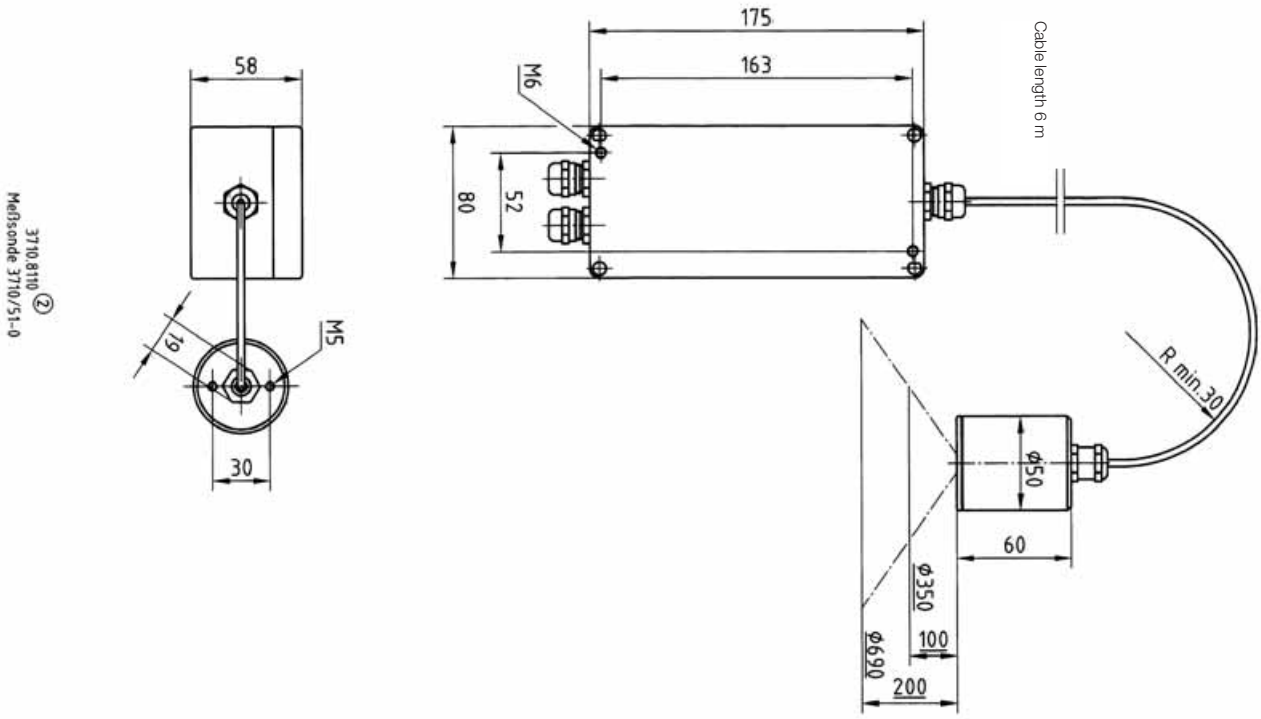


Textodrive TMS model

TECHNICAL DATA | PERMASET VMT

Sensor	Permaset VMT	
Measuring range	0...250 °C	
Spectral sensitivity	2 to 30	
Measured area	Beam-spread angle: 120°	
Output signal	CAN-BUS, Profibus, TCP/IP, S3964/Rk512	
Accuracy	≤ 1 % of readout range at 23 °C	
Response time	t 0,9 = 6 s	
Permissible working temp.	Signal amplifier: 0...+85 °C	sensor with cable: 0...+250 °C
Permissible storage temp.	Signal amplifier: -20...+85 °C	sensor with cable: -25...+250 °C
Environmental rating	KPA to DIN 40040 standards	
Auxiliary power	Max. 20 mA (reversible cut-out and polarity safeguard at input)	
Connection	2-cable glands PG9 to IP65 standard	
Mechanical data	**Sensor**	**Signal amplifier**
Construction	Stainless-steel housing (material no.1.4301) 5 m teflonized connecting cable	In aluminium diecast housing
Enclosure protection	to IP65 standards	IP 65
Weight	8,5 N (= 0,85 kg)	6,5 N (= 0,65 kg)

Dimensions



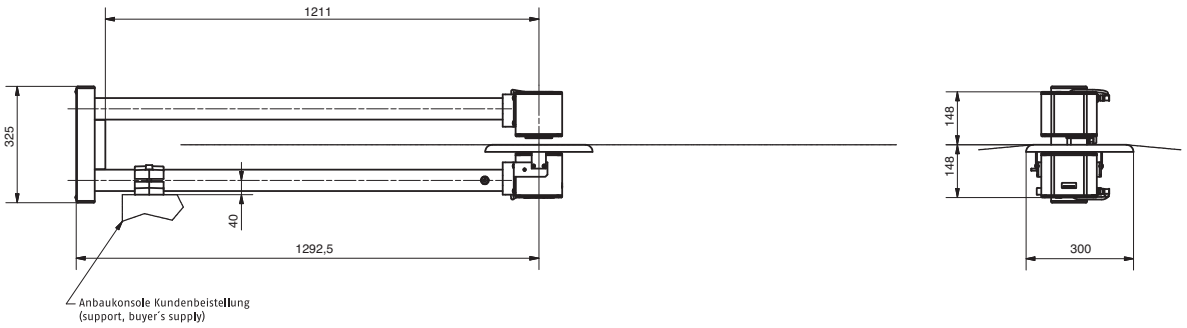
Sensor PERMASET VMT
91-010324-02

TECHNICAL DATA | **FAMACONT PMC**

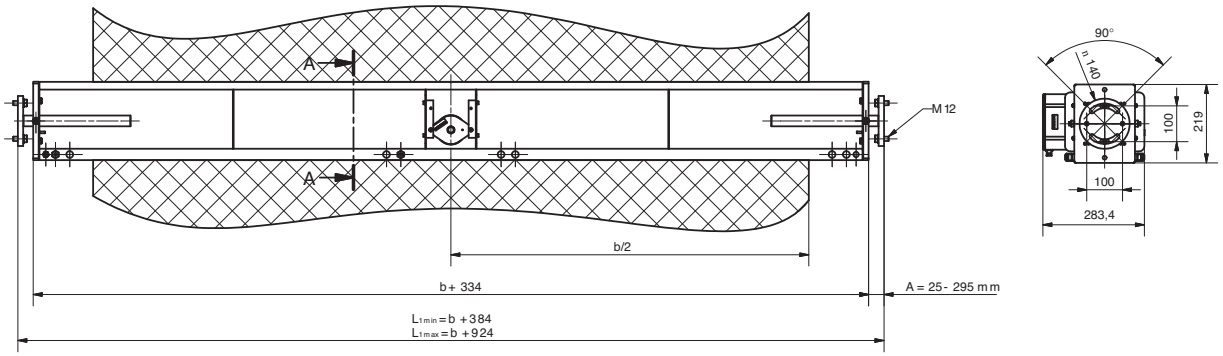
Sensor	Famacont PMC
Measuring principle	Continuous, optoelectronic detection (back or reflex lighting)
Standard measuring range	Up to 70 picks/cm
Line-speed	Dependent on pick-count and type of fabric, a max. of 150 m/min
Permissible angle of distortion	±40°
Standard of protection	IP 54
Ambient conditions	Max. 50 °C, 0–95 % relative humidity (non-condensing)
Host-computer interface (option)	Only along with a basic module: CAN, Profibus-DP, TCP/IP, S3964R/Rk512

INNOVATIONS
We love being technological leaders. And our R&D team works every day to make sure it remains so. Innovations, inventive talent and future-oriented thinking – to guarantee your success.

Dimensions



Sensor FAMACONT PMC
(version with U-frame and plate)
91-013415

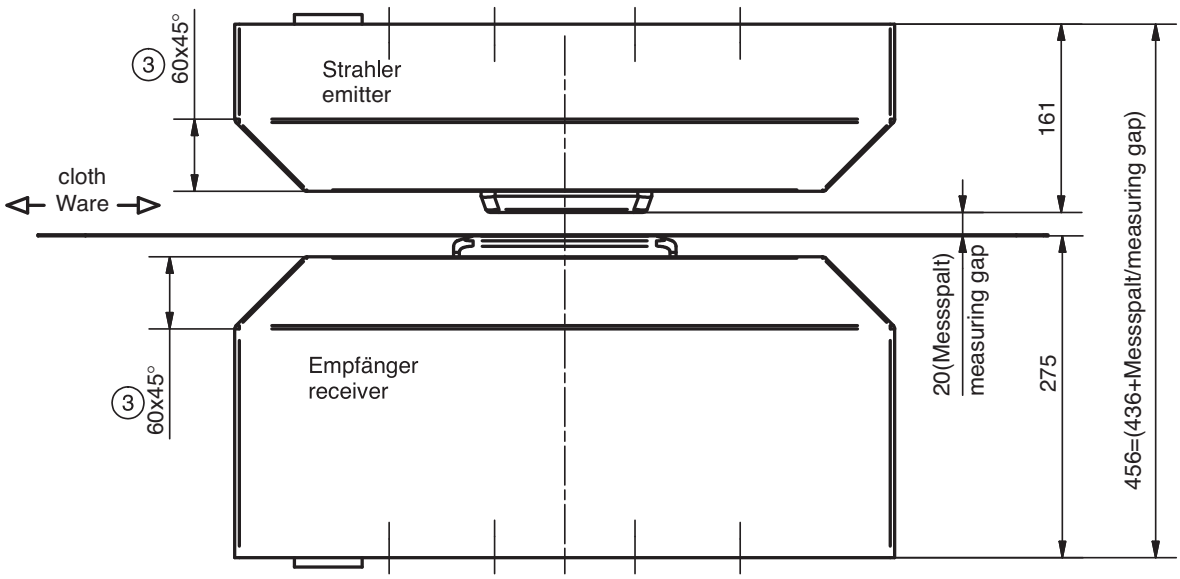


Sensor FAMACONT PMC
(version with guide dish)
91-013613

TECHNICAL DATA | GRAVIMAT FMI

Sensor	Gravimat FMI	
Isotope	Krypton-85	Strontium-90
Activity	400 mCi (15 GBq) or 80 mCi (2,9 GBq)	20 mCi (750 MBq)
Measuring range (in grams per square metre)	10 – 1400 g/m²	100 – 5000 g/m²
Reproducibility (2σ, 1s) (the higher value)	±0.1 % or ±0.1 g/m² (80 mCi : t = 4 s)	±0.3 % or ±0.5 g/m²
Height of scanning gap	10 – 100 mm	10 – 100 mm
Temperature compensation	At 4 points (one each in emitter and receiver enclosures and one each at the top and bottom of the scanning gap)	
Barometric compensation	Electronic, located in the c&d panel	
A/D-converter resolution	16 Bit (1/65536 FS)	
Power supply	230/115V AC 50/60 Hz	
Max. ambient conditions	Max. 60 °C, 0 – 95 % relative humidity (non-condensing) Please enquire re use at higher temperatures	
Max. power consumption	Emitter max. 1 A (continuous: 0.5 A)	Receiver (detector) max. 2 A (continuous: 0.3 A)

Dimensions



Darstellung mit Abdeckhauben
displayed with covers

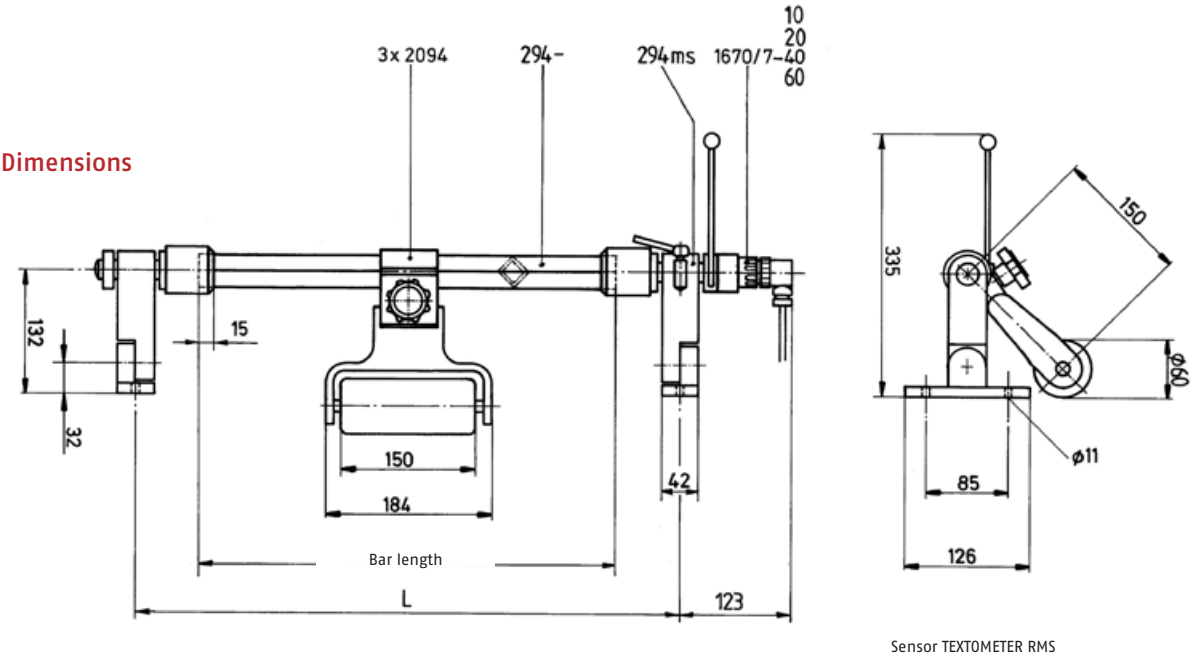
③ Depicted measuring gap

Sensor GRAVIMAT FMI
91-013098-03

PERSONALITIES
You're not just a number to us. Your individual needs and special requirements are our highest priority. We are there for you with our expertise, our leading technology and full dedication. So you can always play to win.

Sensor	Textometer RMS
Type of fibres and blends	Free choice from list, calibration curves stored (unsuitable for nonconductives such as glass, 100 % PA or electrical conductors like metal fibres and filaments)
Measuring range	dependent on type of fibre, blend and electrode: e.g. cotton: 3 – 20 % linen: 7 – 43 % linear scale: 0–100 scale divisions (low residual electrode: from 1 %)
Readout display	Standard electrode (1-channel): highest moisture readout 3-channel electrode: highest, lowest or arithmetical mean readout
Power supply	230/115 V 1 ~, 50/60 Hz
Power consumption	Dependent on electrode
Ambient temperature	Signal amplifier: max. 50 °C
Electrodes	Various types for internal or external mounting in or on sizing machines and dryers of every description. Dimensions and weight dependent on type.

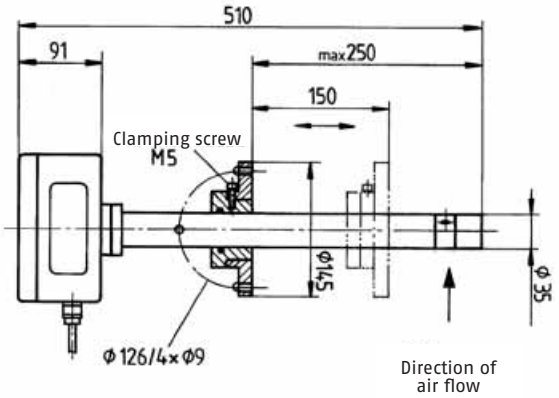
Dimensions

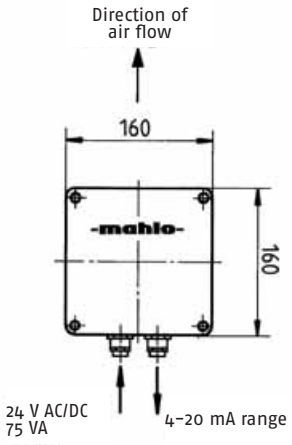


Sensor TEXTOMETER RMS
91-013151-07

Sensor	Ecomat AML			
Measuring range	H_2O 30/50/100 vol. %; 266/622/1000 g/kg; dew point	O_2/polluted gas 30/50/100 vol. %; (CAN only)		
Accuracy	≤ 1 vol. % of maximum scale reading			
Response time	t 60 = 12 s	t 99 = 4 min		
Reproducibility	±0,2 vol. %	±0,2 vol. %		
Sensor ports	0–20 mA, 4–20 mA, CAN (only when linked to basic module and host-computer interface: CAN-Bus, Profibus, TCP/IP, S3964R/Rk512)			
Max. working temperature	Sensor controller:	0...+50 °C	Sensor:	0...+300 °C
Max. storage temperature	Sensor controller:	–25...+50 °C	Sensor:	–25...+300 °C
Environmental rating	JWE to DIN 40040			
Power supply	24 V AC/DC 75 VA			
Connection	3-Pg9 cable glands to IP65 standards (on the electronics enclosure above the flange)			

Dimensions

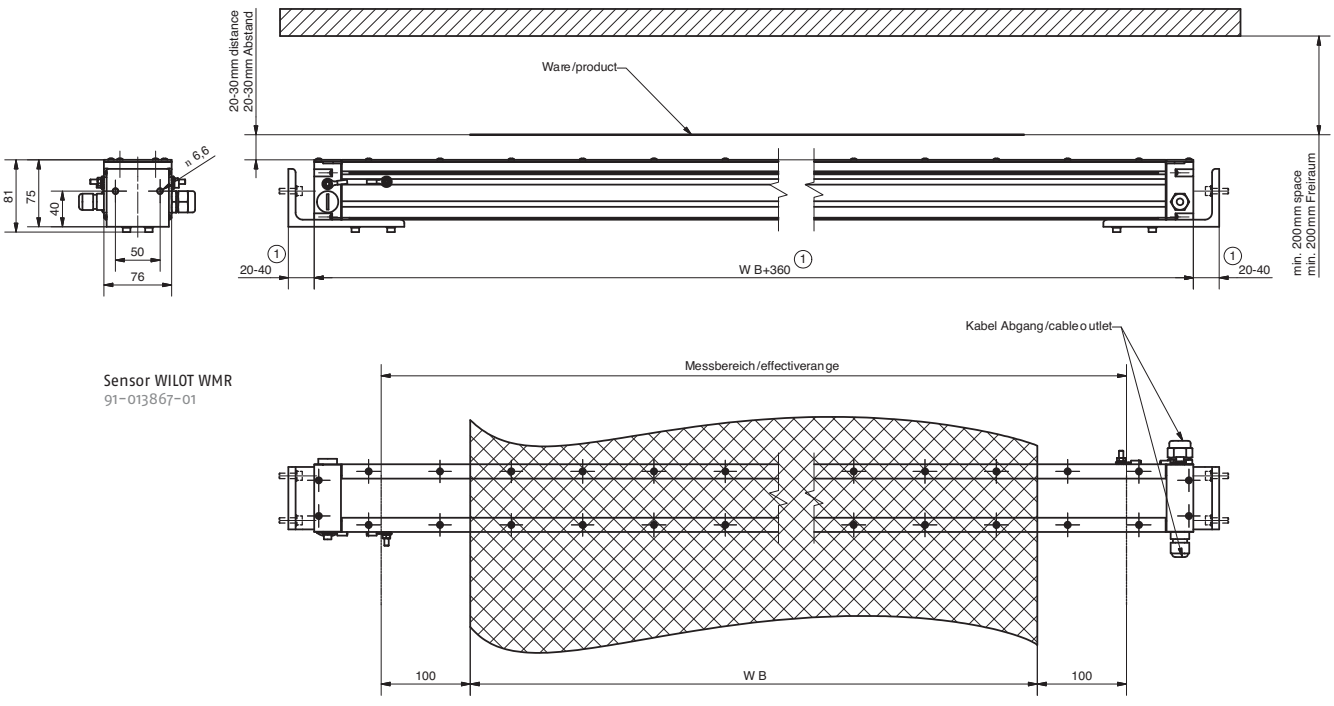




Sensor ECOMAT AML
91-010338-02

Sensor	Wilot WMR
Dimensions of sensing module	Subject to product width
On-line detection by	IR-light-emitting diodes in reflex mode
Accuracy	±5 mm (each end)
Readout update (refresh)	Subject to dimensions (20 ms/m)
Max. product width	6000 mm
Power supply	230V AC 50/60 Hz
Standard of protection	IP 54

Dimensions



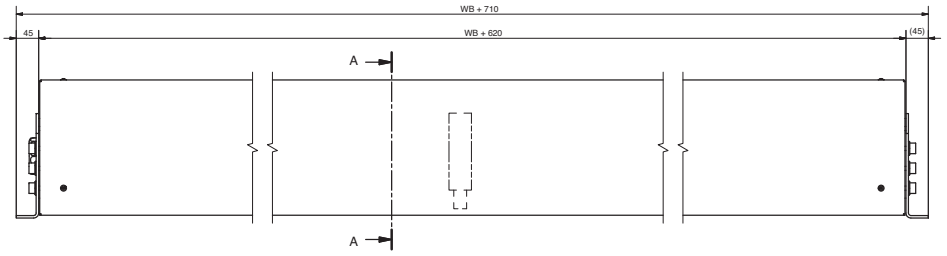
Sensor WILOT WMR
91-013867-01

WB = Warenbreite (product width)

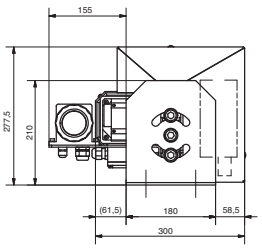
Ab Warenbreite 2600 mm ist kundenseitig eine mittige Abstützung des Sensors vorzusehen.
(If product width exceeds 2600 mm, the user company should provide a central support for the sensor)

Sensor	Thermoscan OMF
Measuring principle	Contact-free measurement of temperature
Measuring range	0 – 250 °C
Measuring time	50 ms
Traversing span	Adjustable via limit switch
Max. ambient temperature	Traverse: 60 °C, control panel: 50 °C
Data communication	CAN-Bus

Dimensions



Sensor THERMOSCAN
91-013580-03



CONTINUANCE
Our decades of experience have made us the reliable partner that we are today. Independent, determined and forward-thinking. So that we can also be here for you tomorrow.

TECHNICAL DATA | ELOTEX DMG • TEXTODRIVE TMS

Sensor	Elotex DMG	
Measuring principle	Contact-type passage count	
Metering wheel diam.	500 mm	
Resolution	1 500 imp/rev	2 5000 imp/rev
Power supply	230V AC 50/60 Hz	
Protection standard	IP 54	

AROUND THE CLOCK

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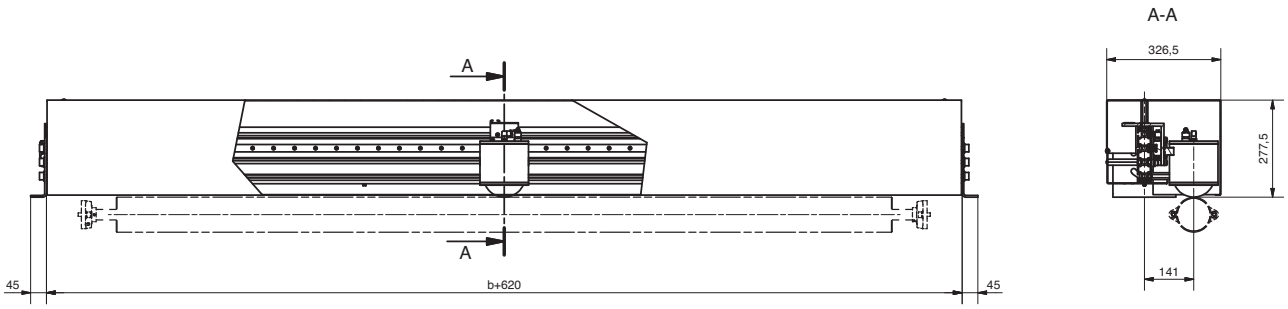
+49-(0)180-50 62 456

Sensor	Textodrive TMS
Measuring principle	Contact-type, edge to edge measurement of moisture
Measuring range	Dependent on type of fibre and blends, e.g. cotton: 3 – 20 %
Traversing span	Adjustable
Offset tolerance Z-axis	15 mm
Alarm outputs	Customer-specific thresholds
Ambient temperature	Traverse: max. 60 °C, control panel: max. 50 °C
Data communication	CAN-bus

Dimensions



Sensor TEXTODRIVE
91-014426

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