

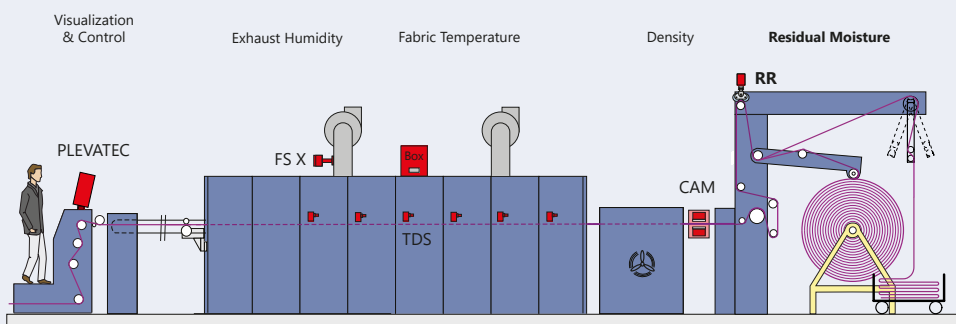
Residual Moisture Measurement

RR



RR Box with tandem roller sensor

RR Wide Box with 2 guide rollers



Measurement technology for low moisture values

AREAS OF APPLICATION

- Textile/nonwovens industry: stenter frame, cylinder dryer, sanforizer, sizing machine
- Paper/tissue industry: all kinds of drying processes
- Leather: drying process
- Food: assessment of moisture in e.g. sausage skins
- ... and many more possible!



BENEFITS FOR CUSTOMER

- Measure residual moisture anywhere in process line
- Optimizing your process quality, efficiency and reproducibility
- Great effect in energy saving
- High product quality by constant residual moisture
- Residual moisture profile
- Avoiding of overdrying

The measurement and control of residual moisture is of great importance in various applications for technological and economic reasons. Continuous measurement and control of residual moisture allows drying processes to be optimized for maximum efficiency: Production speed can be increased, as materials are often over-dried for safety reasons. Overdrying, which also means a loss of quality and damage to the material itself, can be prevented. Lastly, energy consumption for the expensive drying processes can be reduced.

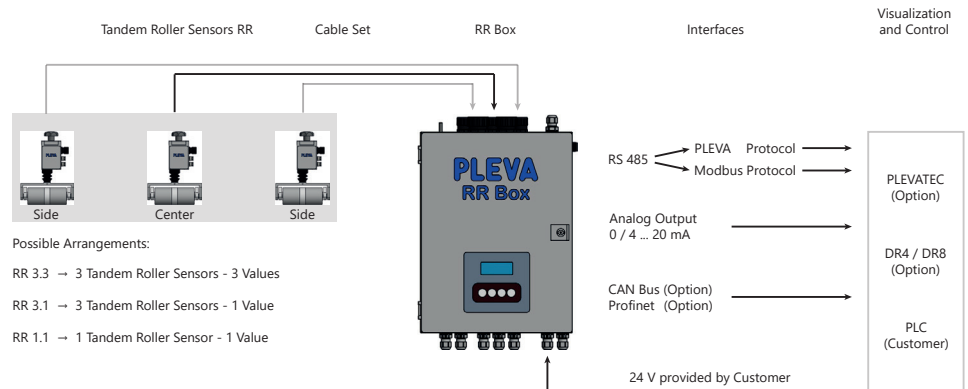
For sustainability aspects this means that due to an optimized process and reduced energy consumption, CO₂ emissions can be lowered. In addition, second choice goods and waste of material can be avoided thanks to process monitoring and the associated reproducibility.

This makes the RR a hero for sustainability.

Design

The new PLEVA RR box is designed to connect up to 4 individual measurement signals to one micro processor box.

The new evaluation box is equipped with the latest state of processor technology and considerably improved EMC protection.



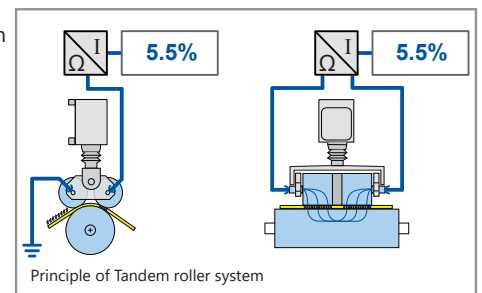
Measuring principle

The RR is used for contact measurement of planiform fabric webs such as textiles, bonded fabrics, paper, leather, etc...

The RR is based on measurement of the electrical resistance. This increases exponentially as the residual moisture decreases.

The special design of the tandem roller sensor allows the measurement of very low to high residual moisture content of natural and synthetic fiber blends.

Electrostatic charges are discharged by the RR tandem roller itself and by new electronics and do not impair measurement.

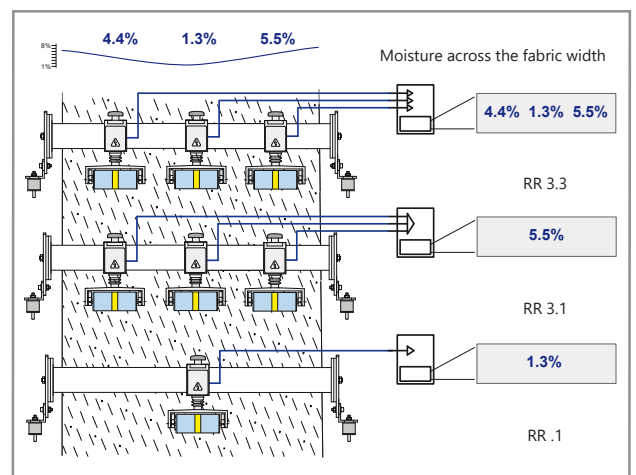


Residual moisture across the fabric

RR 3.3 Profile over the fabric width with 3 tandem roller sensors (side/center/side)

RR 3.1 Maximum moisture value of 3 tandem roller sensors (side/center/side)

RR 1.1 Moisture value of 1 tandem roller sensor in the fabric center



Residual moisture with tandem roller sensor

Application of RR tandem roller sensor

The residual moisture measuring device RR with tandem roller sensor is used for lowest level of moisture values or the measurement of synthetics or mixed fibres with synthetics.

This sensor uses integrated protective devices to counter interfering electrostatic charges.

The measuring range depends on fibre, e.g.:

Cotton:	1.0 .. 20 %
Synthetics:	0.1 .. 5 %
Polyamide:	0.2 .. 10 %
Viscose:	1.2 .. 35 %
Universal range:	0 .. 100 SCD (scale division)

Types:	RR 1.1 = 1 tandem roller / 1 signal
	RR 3.1 = 3 tandem rollers / 1 signal
	RR 3.3 = 3 tandem rollers / 3 signals

Constructional Design

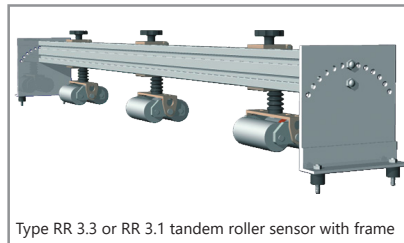
The tandem roller sensors use a damping system for stable measurement. This system ensures a highly reproducible measuring.

The sensor's first roller serves to divert most of the interfering electrostatic charges. The divided roller is the second roller in fabric running direction and is used for the measurement.

The measuring frame enables the alignment of the tandem roller sensors over the whole width and the lifting of the sensors, if required.



Type RR Tandem roller sensor



Type RR 3.3 or RR 3.1 tandem roller sensor with frame

RR Box with tandem roller

Type RR 1.1 • RR 3.1 • RR 3.3

FEATURES OF RR TANDEM ROLLER

- Measurement of very low residual moisture values
- For natural fibres and blends with synthetics
- Protected against electrostatic charges
- Spring / dampening system
- Easy lift-off

Residual moisture on insulated guide rollers

Application of RR W sensor

The residual moisture measuring device type RR W measures the residual moisture over the full fabric width on two guide rollers made of stainless steel.

The sensor RR W will be used at e.g. knitted fabric, or at surface sensitive fabrics like sanded, raised or high-piled fabric after stenter frame.

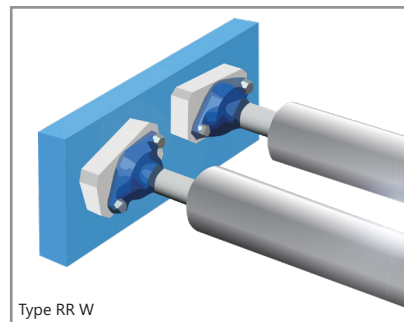
The measuring range of type RR W at

Cotton:	4 .. 20 %
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The measurement (not more than 5 %) of mixed fibres with synthetics is possible only with limitations for type RR W because of the high electrostatics that are produced for this type of fabric.

Design of type RR W

Both metallic measuring rollers must be highly insulated with respect to the machine frame. Therefore both roller bearings must be mounted on a insulating plate.



Type RR W



Sensor type RR W to measure over the full fabric width on two rollers

RR Wide Box with guide rollers

Type RR Wide Box

FEATURES OF RR WIDE BOX

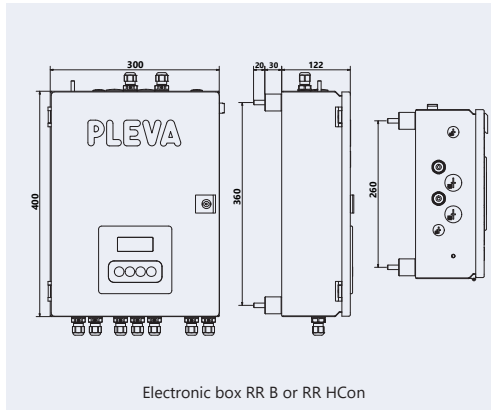
- Favourable price
- Avoid marks on the fabrics
- Reliable and sturdy
- Suitable for knitted fabrics

LIMITS OF MEASUREMENT OF RR WIDE BOX

- Measuring range: 4 .. 20 % Cotton
- Measurement accuracy is lower than the measurement accuracy with tandem rollers
- Suitable for natural fibres or blends with not more than 5 % synthetics
- No protection against electrostatics

Tandem roller sensor

Type RR Box or RR HCon Box stand alone



Electronic box RR B or RR HCon

Electronic box RR B

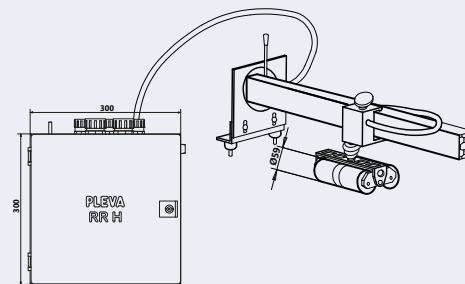
Sensors maximal: up to 4 sensors
 Preamplifiers: up to 4 preamplifiers HIMA8
 Ambient temperature: max. 50 °C
 Supply voltage: 24 V DC (± 10 %)
 Power consumption: max. 12 VA, 0,5 mA
 Interfaces: RS485 serial, 0/4...20 mA, Modbus, Pleva, Mininet, Profinet, CAN (option)
 Weight: approx. 10 kg

Electronic box RR HCon

Sensors maximal: up to 4 sensors RR W H
 Measuring values: up to 4 incl. values across multiple sensors

Type RR 3.3 H, RR 3.1 H, RR 1.1 H, RR W H with HIMA Box RR H, side plates and frame

- for connection to RR HCon Box or PLEVA Process Box

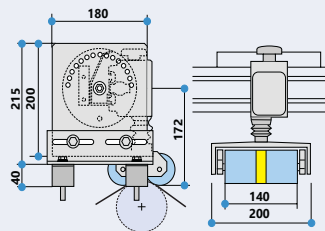


HIMA box with tandem roller sensor RR H on measuring frame

Measuring frame with tandem roller sensor RR H and HIMA box RR H for connection to HCon box or PLEVA Process Box

Sensors maximal: up to 1 sensor RR 1.1 H, RR 3.1 H or RR 3.3 H
 Preamplifiers: up to 3 preamplifiers HIMA8
 Ambient temperature: max. 70 °C
 Supply voltage: 24 V DC (± 10 %)
 Power consumption: max. 3 VA, 0,1 mA
 Weight HIMA-Box RR H: approx. 6 kg

Type RR with side plates

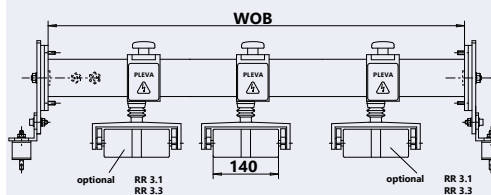


RR Tandem roller sensor with side plate and swing out unit

Sensor RR tandem roller

Ambient temperature: Measuring frame max. 80 °C
 Measuring frame/roller: max. 100 °C
 Measuring range sensor RR: 1.0 ... 20 % at Cotton
 0.1 ... 5 % at Synthetics
 0.2 ... 10 % at Polyamide
 1.2 ... 35 % at Viscose
 Universal measuring range: 0 ... 100 SCD (scale division)
 Weight tandem roller: approx. 1,8 kg
 Weight frame: approx. 25 kg (approx. 2000mm) (depends on the frame width)

Type RR 3.3 • RR 3.1 • RR 1.1 with side plates and frame



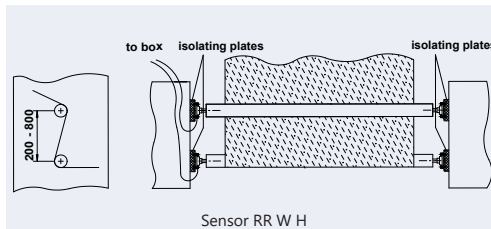
Measuring frame with tandem roller sensors RR

Measuring frame with tandem roller sensors

Type RR 1.1 G: 1 tandem roller sensor / 1 HIMA8 amplifier
 Type RR 3.1 G: 3 tandem roller sensors / 1 HIMA8 amplifier
 Type RR 3.3 G: 3 tandem roller sensors / 3 HIMA8 amplifier
 Side plates for mounting: with swing out unit
 Frame construction: made of aluminium
 Frame dimension standard: width up to 2.79 m, wide frame with: available up to 6.00 m

Type RR Wide Box

- Suitable for natural fibres or blends with not more than 5 % synthetics



Sensor RR W H

Sensor RR Wide Box

Preamplifier: 1 HIMA7 amplifier
 Ambient temperature: measuring amplifier and cable to the rollers max. 50 °C
 Measuring range sensor: 4 ... 20 % at Cotton
 Universal measuring range: 0 ... 100 SCD (scale division)
 Supply voltage: 24 V DC (± 10 %)
 Power consumption: approx. 5 VA, 0,2 mA
 Weight sensor RR W kit: approx. 1,2 kg

Description	Stand alone device	Sensors to be connected to PLEVA Process Box or HCon Box
1 tandem roller / 1 signal	RR Box 1.1	RR 1.1 H
3 tandem roller / 1 signal	RR Box 3.1	RR 3.1 H
3 tandem roller / 3 signal	RR Box 3.3	not possible
2 roller / 1 signal	RR Wide Box	RR W H



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Special versions and constructions for different materials and applications are available.

Tandem roller sensors are available with measuring frame produced with the required frame width. Alternatively the measurements are available without frame. In this case, the profile is delivered locally by the customer.