

Residual moisture

measurement and control
of drying process

RR



Residual moisture



Measurement by Tandem roller sensor RR

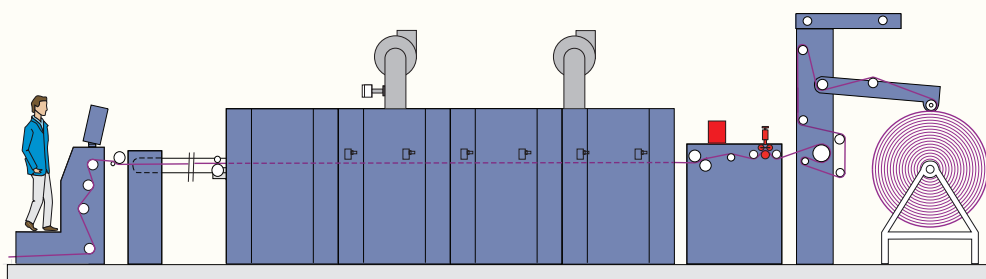
PLEVA RR Box



Measurement with multiple Tandem roller sensors RR 1.1 • RR 3.1 • RR 3.3

RR Box

Stand alone with
Tandem roller sensor



RR Wide Box

Stand alone with
guide rollers

RR Box

PLEVA RR Box series 600

Measurement of residual moisture

Type RR Box

FEATURES OF PRODUCT

- Measure the residual moisture anywhere in the process line
- New additional universal measuring range scaling 0 ... 100 SCD
- Improved EMC protection
- Extended measuring range 1.0 .. 20.0% CO
- Higher accuracy of measurement
- Option: Own calibration curve

Application

The measurement and control of residual moisture is of great importance for technological and economic reasons at different steps in the production.

The measurement is used e.g. behind dryer, stenter, sizing machines, cylinder dryer, humidifier or in front of padding mangle.

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.



PLEVA RR Box

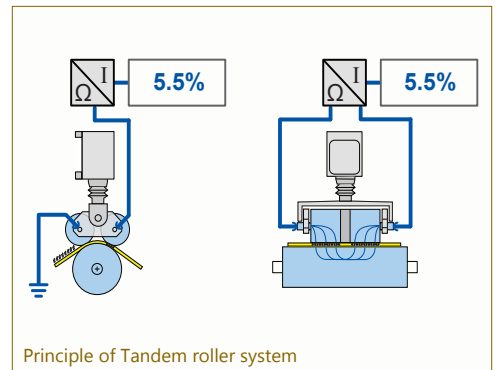
Measuring principle

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.



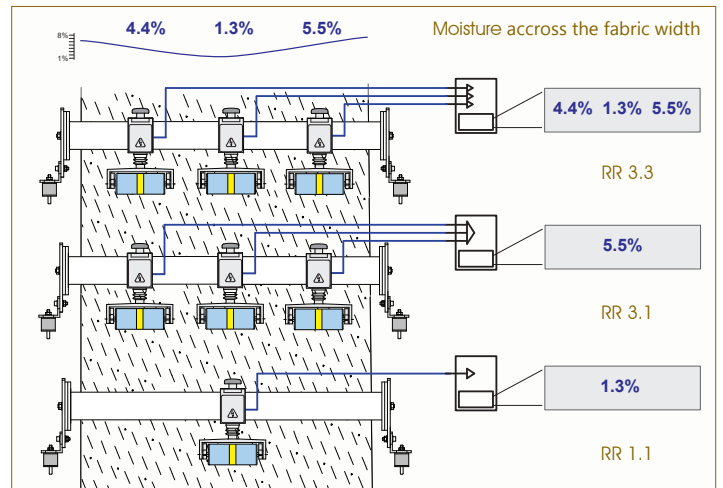
Principle of Tandem roller system

BENEFIT FOR CUSTOMER

- Economical price for sensor package
- 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

Residual moisture across the fabric

- RR 3.3 Profile over the fabric width with 3 Tandem roller sensors (side/centre/side)
- RR 3.1 Maximum moisture value of 3 Tandem roller sensors (side/centre/side)
- RR 1.1 Moisture value of 1 Tandem roller sensor in the fabric centre



Applications

- Dryers (stenter frame, cylinder dryer)
- Sanforizer
- Sizing machine
- Textile, paper, leather



Sensor type RR 3.3 to measure over the width left - centre - right

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



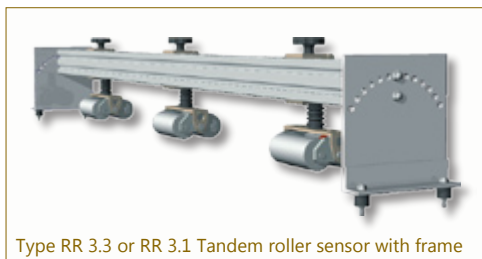
Type RR Tandem roller sensor

Constructional Design

The Tandem roller sensors use a damping system for high reproducibility. This system ensures a 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 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

Residual moisture on insulated guide rollers

Application of RR W sensor

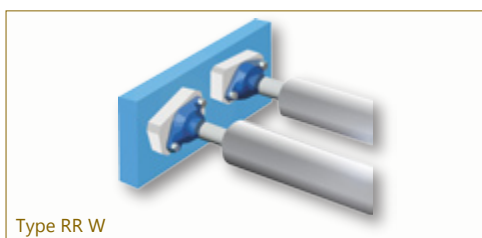
The residual moisture measuring device type RR W measures the residual moisture over the full fabric width on two guide rollers made of stainless steel.

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 .. 16 %
---------	-----------

The measurement of synthetics or 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.



Type RR W

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 plates.

RR Wide Box with guide rollers

Type RR Wide Box

FEATURES OF RR Wide Box

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

Limits of measurement of RR Wide Box

- Measuring range: 4 .. 16 % 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

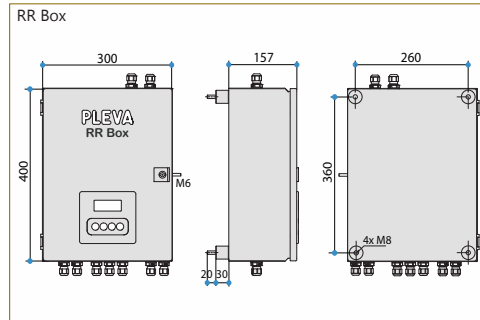


Sensor type RR W to measure over the full fabric width on two rollers

Residual moisture PLEVA RR Box

Type RR Box stand alone

Technical Data

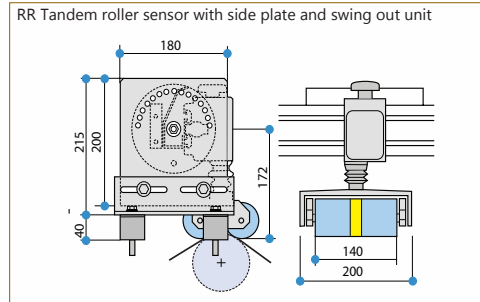


PLEVA RR Box

Sensors maximal: up to 4 sensors
 Preamplifiers: up to 4 preamplifiers HIMA8
 Ambient temperature: max. 50 °C
 Power supply: 24V DC (+/- 10%)
 Power consumption: max. 12 VA
 Current: max. 0.5 Amps
 Communication: RS485 serial
 Protocols: MODBUS, PLEVA, MININET
 Analogue outputs: max. 8 signals 0/4 .. 20mA (isolated)
 Weight approx.: 10 kg

Tandem Roller with side plates

Type RR with side plates

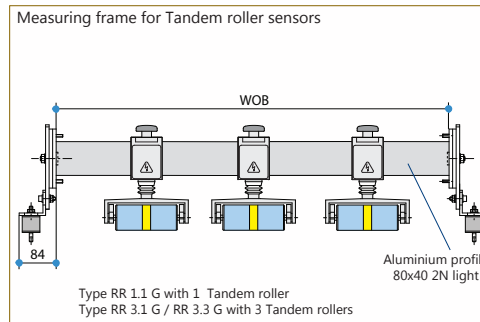


Sensor RR Tandem roller

Ambient temperature: max. 100 °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 sensor RR with swing out unit: approx. 14 kg

Tandem Roller with side plates + frame

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



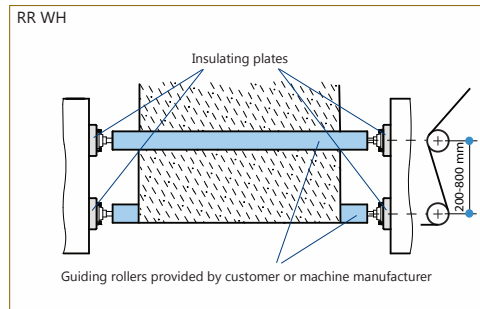
Measuring frame with Tandem roller sensors

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

Residual moisture RR Wide

Type RR Wide Box

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



Sensor RR Wide Box

Preamplifier: Type HIMA7
 Ambient temperature: max. 100 °C
 Measuring frame/roller: max. 100 °C
 Electronic preamplifier box: max. 50 °C
 Measuring range sensor: 4 .. 16 % at Cotton
 Universal measuring range: 0 .. 100 SCD (scale division)
 Power supply: 24 V DC (+/- 10 %)
 Power consumption: approx. 5.0 VA, 0.2 Amps.
 Weight sensor RR W kit: approx. 1.2 kg



Headquarter and Manufacturing:

Rudolf-Diesel-Str. 2
 D-72186 Empfingen-Germany
 Tel: +49 (0) 7485 1004
 Fax: +49 (0) 7485 1009
 E-mail: info@pleva.org
 www.pleva.org



PLEVA Sales and Support in ASIA:

CINTEX AG Hauptstrasse 58
 CH-8274 Tägerwilten-Switzerland
 Tel: +41 71 667 02 50
 Fax: +41 71 667 02 51
 E-mail: info@cintex.ch
 www.cintex.ch www.pleva.ch



Description	Stand-alone device	Sensor to be connected to
1 Tandem roller / 1 signal	RR Box 1.1	PLEVA Process box
3 Tandem rollers / 1 signal	RR Box 3.1	RR 1.1 H
3 Tandem rollers / 3 signals	RR Box 3.3	RR 3.1 H
2 Rollers / 1 signal	RR Wide Box	not possible
		RR WH

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.

Available monitoring and control systems for different applications

- **CIMATIC Touch panels** PP70 • PP100 • PP150 PC based, with separate PLC and standard software.
- **PLEVATEC Touch panels** PC based, with separate PLC and modular software for special applications.
- **ECO-OPTIDRY®** with energy consumption meter for drying process
- **Add'nDry** for coating process
- **PadderControl** for continuous dyeing process
- **SizeControl** for controlled size pick-up
- **DensityControl** for pick/course density
- **StraightLiner** for automatic straightening and distortion analysis
- **StructureDetector** for distortion analysis