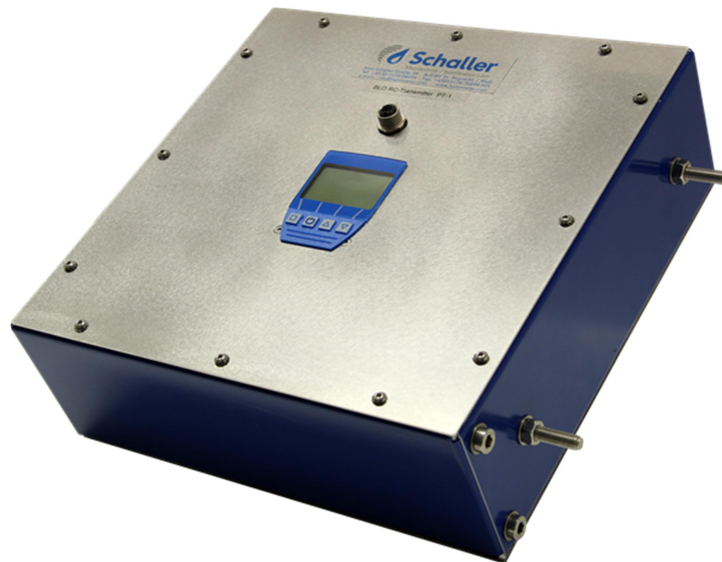




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User manual



BRC moisture transmitter for determination of water content of dry wood chips

Version 1.1
2017

1. General information

The BRC moisture transmitter allows the online measurement of moisture (optionally moisture and temperature) of wood chips. Therefore a fixed sensor is embedded in the material stream. The BRC moisture transmitter is a readily calibrated system, the measuring values are calculated by the transmitter. The water content (and optionally the temperature of the material) are transmitted by a 4 to 20 mA analogue output. The sensor has been developed especially for dry wood chips.

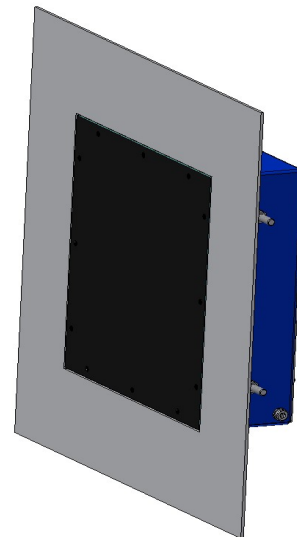
2. Mounting the sensor

Requirements:

During the measurement, the black sensor surface has to have constant contact with the product (wood chips). The sensor penetrates the complete material to measure up to a measuring depth of 300 mm. For correct measuring results it is essential that the amount of material in front of the sensor measuring field is constant. In the measuring field must not be any other material.

Possible installation positions:

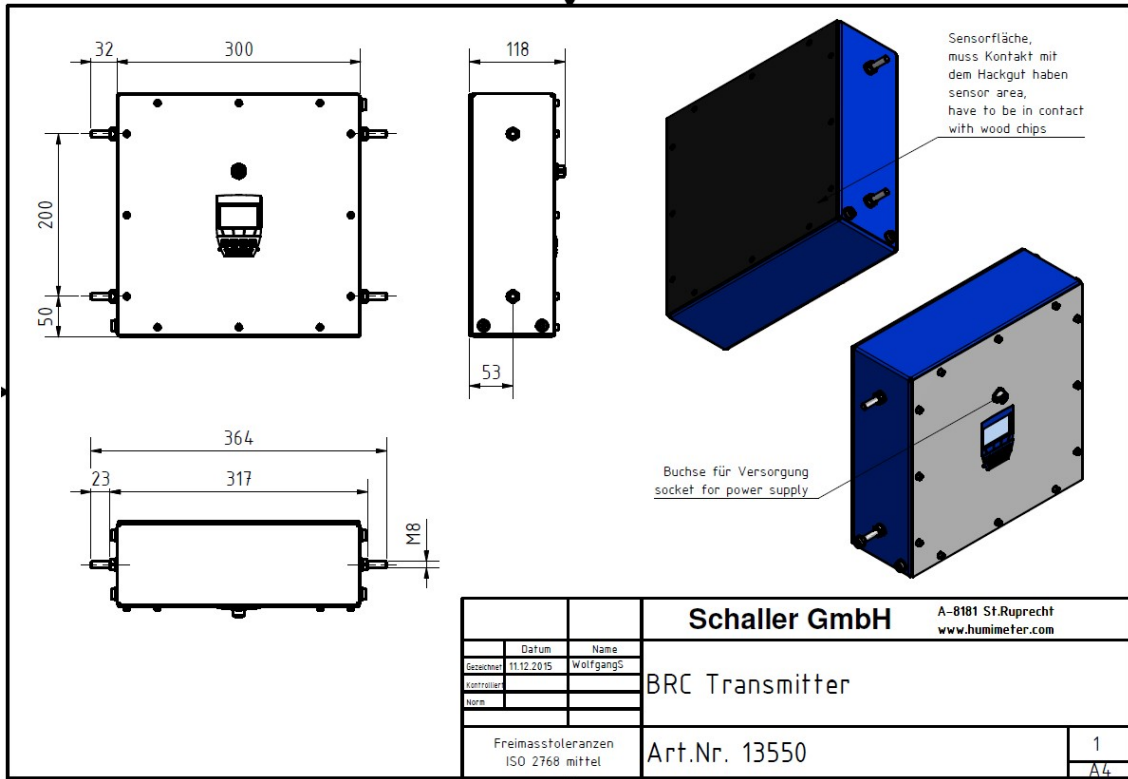
- Bunker:
Installation at the side wall
- Push floor:
Installation at the side wall



Measuring principle:

The capacitive measuring principle utilizes the different dielectric coefficient (electric field permeability of a material) of dry, nonconductive material (approx. 2-10) and water (approx. 80). The wetter the material, the higher is its dielectric coefficient. Material with higher water content in the stray field of the sensor is reflected in a higher capacity. The evaluation electronics converts this capacity value into weight percent and shows the water content on the display.

3. Drawing



4. Electrical connection

The BRC moisture transmitter has to be supplied with 24 VDC (15 to 29VDC). The measuring values are output via an analogue 4 to 20mA power output. The scope of delivery contains a plug with open cable ends for power supply and analogue output.

Connector pin assignment

white	24 VDC power supply (15 to 29VDC)
brown	ground power supply & analogue output
yellow/green	shield of cable
blue	analogue output water content 4 to 20mA
grey	Optional analogue output temperature 4 to 20mA

For connecting with the analysing unit (PLC), a shielded cable with minimum wire of 0.25mm² has to be used.

The cable shield has to be grounded at the analysing unit (PLC)!



5. Scaling of analogue output

The water content values are transmitted continuously via the 4 to 20mA analogue output.

The output of temperature values is available optionally.

signal	type	Minimum value	Maximum value
moisture	4 to 20mA	4mA \triangleq 0%	20mA \triangleq 30%
temperature	4 to 20mA	4mA \triangleq -10°C	20mA \triangleq 70,0°C

6. Calibration curves

Name	Description	Measuring range
1 – wood chips	Wood chips of very high density	2 - 30%
2 - wood chips	Wood chips of high density	2 - 30%
3 wood chips	Standard wood chips	2 - 30%
4 + wood chips	Wood chips of low density	2 - 30%
5 ++ wood chips	Wood chips of very low density	2 - 30%
<i>Reference</i>	<i>Only for Schaller GmbH</i>	

7. Adjust

After the installation, as well as every 4 weeks in operation, the moisture transmitter has to be adjusted.

For that, the BRC transmitter has to be switched on for at least five minutes before starting the adjustment.

Make sure that there is no material on the black sensor area. The temperature of the sensor should be nearly the same than during the measurement.

Press two times the left button (↶) to change into the main menu.

Select the menu item “**Options**” using the ▲ or ▼ button and confirm by pressing the second button (⏏).

Then navigate to “**Adjust**” using the ▲ or ▼ button and confirm by pressing the second button (⏏) again.

Now a message box “**Reinitialize?**” will appear.

Confirm by pressing the second button (⏏).



8. Exemption from liability

For mis-readings and wrong measurements and of this resulting damage we refuse any liability. This is a device for quick determination of moisture. The moisture depends on multiple conditions and multiple materials. Therefore we recommend a plausibility check of the measuring results. Each device includes a serial number and the guarantee stamp. If those are broken, no claims for guarantee can be made. In case of a faulty device, please contact Schaller GmbH or your local dealer.

9. Technical data

Moisture measuring range	2 to 30 % water content
Material temperature	0 to +50 °C
Ambient temperature	-10 to +60 °C (not condensating)
Protection class	IP52
Power supply	24 VDC (15 - 29 VDC)
Power consumption	90mA & analogue output (4-20mA)
Dimensions	364 x 300 x 118 mm
Weight	3.7 kg

10. Device maintenance instructions

- Please always keep in mind that the moisture sensors are sensitive measuring instruments and handle them **WITH CAUTION**.
- If any problems arise during the measurement, please first of all reboot the system (disconnect the electrical supply).
- The sensor has to be cleaned from pollution or something similar periodically.
- Do not bend the cables of the sensor. We recommend the installation of a protection as the sensor may be damaged if the cable is bended too often.
- A wrong connection may destroy the sensor. This is no case of warranty.

11. Most common reasons for mis-readings

- When there is no material above the sensor, the air value is displayed (2.0%)
- The measuring field is not totally covered with wood chips.
- Condensation of water drops on the measuring surface of the sensor
- The temperature (material, surroundings) is out of the specified range. In general with rising temperatures the accuracy will decrease due to the higher compensation factor
- Unequal contact pressure of the material onto the sensor
- The cables must not lie in the area of electro-magnetic interference fields
- The sensor plug is not connected properly.
- Before opening the control unit, please get in contact with Schaller GmbH in order to clarify possible errors previously.