

Product sheet

RET-5501

White water consistency measurement

FEATURES

- High accuracy of total consistency
- Easy calibration
- Independent of process pressure
- Real time results
- One state-of the art communication platform
- Lean design and top functionality

BENEFITS

- Retention chemical savings
- Faster grade changes
- Closed loop retention aid control
- Lowest total cost of operation
- Low start-up and installation cost



GENERAL / BACKGROUND

The RET-5501 is the perfect solution for measuring total consistency of pulp suspensions in the range of 0.01-2% such as in white water where filler or ash content is not an issue. Due to its LED technology, it can easily be calibrated to secure stable and accurate consistency based on laboratory determination. Total consistency values are independent of variation in pulp brightness or color.

The sensor is mounted in a special bypass arrangement and provides real time results. The unit has a unique low-maintenance probe which is fed by a pump solution ideally suited for these applications. All modules built on a frame allow for plug and play features with short start-up times. High installation flexibility is achieved through a variety of customized options plus the unit's independency of process pressure and process layout.

The sensor electronic employs modern microprocessor technology with advanced signal analysis. It is operated using BTG's electronic platform, the CPM, which ensures compatibility with present and future communication interface requirements, from analogue output with HART® to field buses. The RET-5501 offers a number of advanced capabilities. In combination with BTG's inline sensors and specialist application know-how, it is the perfect solution for retention control applications.

As part of the new generation of easier smaller, smarter and lighter BTG instruments, the sensor is designed to help you rapidly optimize the paper, board and liner process, for significant cost and productivity improvements.



Use QR-code or link for more information
www.btg.com/mybtg/en/instruments/ret-55xx

MEASURING PRINCIPLE / MEASUREMENT

The RET-5501 employs the patented Peak Method for measuring total consistency of paper suspensions using a flow through sensor.

This technology is based on the fact that suspensions contain both large and small particles. Large particles are typically the fibers and small particles are the fillers and fines. The large particles form a relatively transparent network, within which the small particles move freely.

A narrow light beam directed through the suspension is generally affected by both the large and small particles. (Fig 1 and Fig 2).

Close study of a certain volume of suspension shows that the number of small particles in the suspension is great and relatively constant over time. On the other hand, the number of large particles is small and varies significantly over time.

If a short time period is studied, in which only a single fiber passes the light gap, the fiber covers the light. On the other hand when no fiber is in the gap a lot light comes through. This is the "Peak" period and provides valuable information on the fine/ash content in the pulp suspension. As the suspension passes the gap, a DC-signal is created with information on both large and small particles.



Figure 1: Measuring principle of the RET-5501

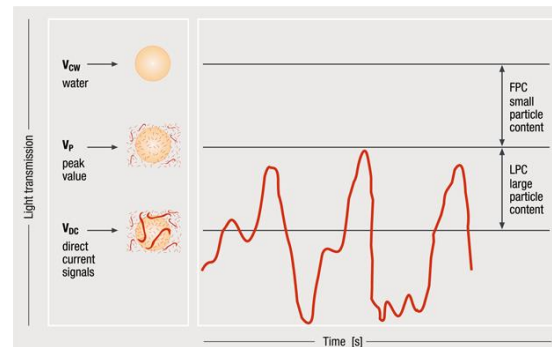


Figure 2: Time diagram of the detector signal

APPLICATION EXAMPLE

CLOSED LOOP RETENTION AID CONTROL

On board machines with a conventional headbox, the optimum solution for closed loop retention control is to install one TCT-2501 sensor in the HC line after the fan pump and one RET-5501 in the white water. The optimum installation point depends on the application, but is either located in the tray water or the total white water (Fig 3).

Retention aid additions can be controlled by continuously measuring the white water consistency. In many process steps white water is used for dilution and for consistency control. Thus white water consistency stabilization results in faster grade changes, reduced basis weight variability and optimized disc filter operation.

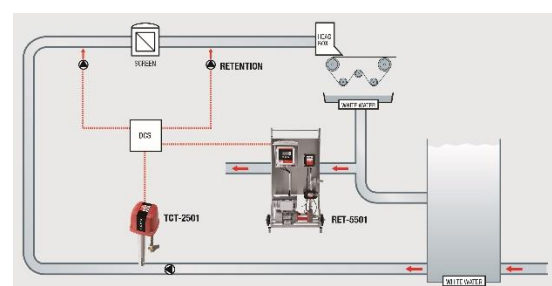


Figure 3: Typical installation of TCT-2501 and a RET-5501 in a conventional headbox board machine

TECHNICAL DATA / SPECIFICATIONS

GENERAL

Type	RET-5501 bypass solution with a smart optical total consistency sensor for pulp suspensions
Manufacturer	BTG Instruments AB, Säffle, Sweden
Measuring principle	Light transmission and scattering using BTG's patented Peak Method. Performed by light transmission of NIR, 880 nm technology
Measuring range	0.01 to 2.00 % total consistency and depending on filler content and fiber type
Repeatability	± 0.002% Cs

PROCESS SPECIFICATIONS

Process pressure	Independent of process pressure
Media temperature	Max. 100°C [212°F] Min. 5°C [16°F]
Max. ambient temperature	50°C [122°F]
Flow velocity	Independent of sample flow
Process pH	4 – 9
Sample flow	15 - 20 l/min [4 – 5.3 gal/min]

Material:

Wetted parts	Stainless steel, EN 1.4404, equiv. to ASTM 316L
Electronics box	Painted aluminum

Weight:

RET-5501 complete	30 Kg [66 lb]
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Mounting:

Sealing water	Standard quality water with no impurities larger than 200 µm [8 thou]. Min 1.5 l/min [0.4 gal/min] Process pressure + 0.5 bar ½ " hose connection
Sample feed and outlet line	Feed: 1" outer thread Out: ½ " inner thread

Water:

Water consumption	20-30 l/min [5.3-7.9 gal/ min] during cleaning
Water quality	Standard quality with no impurities larger than 200 µm [8 thou].
Water pressure	2 – 5 bar [29 – 72.5 psi]

Air

Air connections	6/4 mm
Air Pressure	4 – 8 bar [58 – 116 psi]

Electrical connection

100-240 ±10% VAC, 50/60 Hz. Connected through CPM and Pump module
Max 0.55 kW for both 110 and 220 VAC variants, a 10 A fuse is imperative.

Power consumption

Communication platform (CPM)

For information about the CPM, including input and output signals, see the CPM product sheet PS2026

Functions:

Output signal	Total consistency in % or mg/l
Calibration sets	Four separate calibration sets, individually programmable, and externally controllable
Alarm function	Provides alarm signal on low and high consistency level, unstable signal
User interface	See Communication platform (CPM)
Serial port	RS485

SAFETY & DIRECTIVES

Safety and protection class:

Product safety	CE, C-tick, ETL
Protective rating	Equivalent to IP65, NEMA 4x

EU-directives

Designed in accordance with relevant CE standards.

Quality Assurance

Quality-assured in accordance with ISO 9001.

Optional:

Deaeration vessel	
Stand	Weight: 2.9 kg [6.4 lb]
Wheel kit	
Hand-operated valve	Sample and drain
Valve kits	Sample and drain valve kit Flushing valve kit

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DIMENSION DRAWINGS

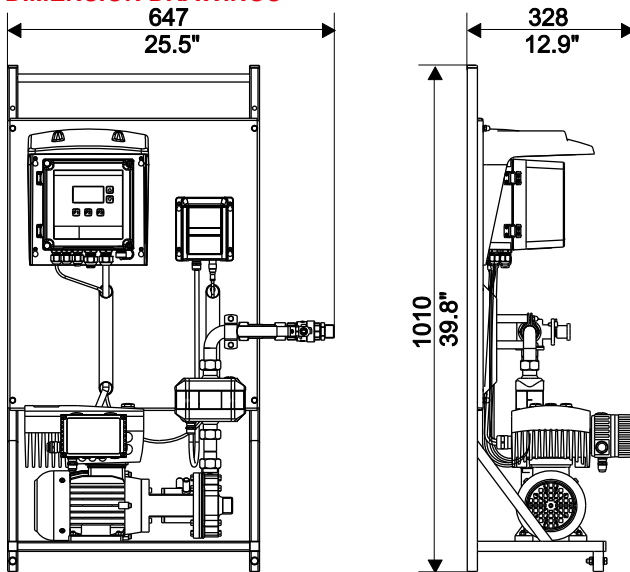


Figure 4: RET-5501 complete

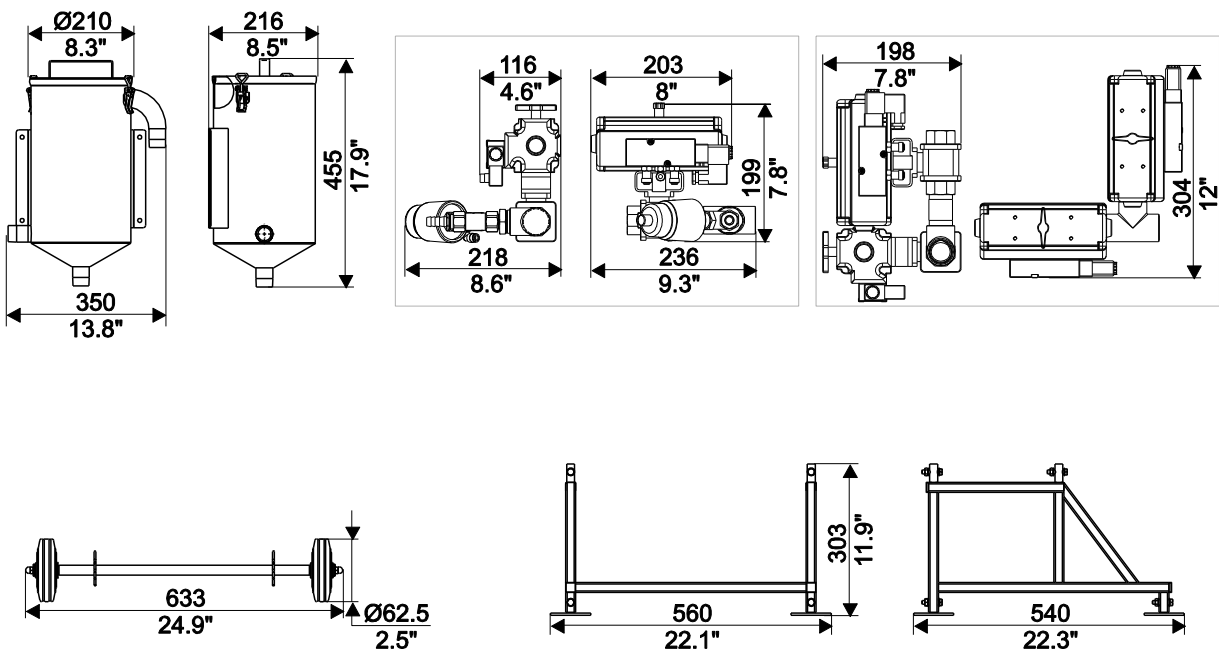


Figure 5: Accessories