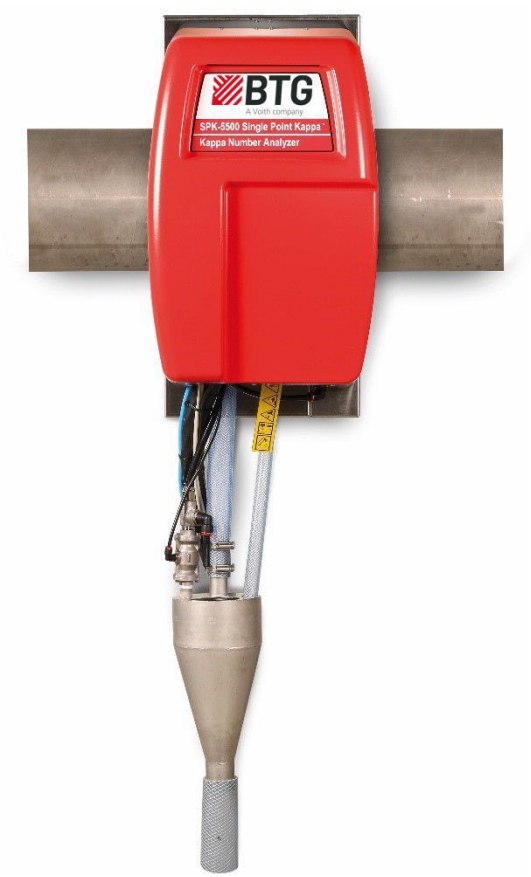
Product sheet

SPK-5500 Single Point Kappa™

Kappa Number Analyzer



FEATURES

- **Single Point high frequency measurement**
- **High accuracy UV LED-based lignin determination**
- **Easy calibration with long term stability**
- **All-in-one pulp sampling, screening, washing and measurement**
- **High availability, robust system with less auxiliaries**
- **One state-of the art communication platform**

BENEFITS

- **Improved process control for raised productivity**
- **Lower capital cost – apply in key positions only**
- **Stepwise capital investment**
- **Lower installation cost – no external samplers and sample transport piping**
- **Operational in one day upon installation**
- **Lower total cost of operation**

GENERAL / BACKGROUND

BTG's, Single Point Kappa Analyzer, SPK-5500, is an in-line kappa analyzer which measures the lignin content of pulp fibers. Optionally it can also measure hexenuronic acid (HexA). The analyzer is mounted directly to the pulp processing pipeline and contains all unit operations of the traditional multi point kappa analyzer. Thus there is no need for the remote pulp sampler, associated water valves and transport lines from the sampler to the kappa analyzer. The SPK handles all operations in one unit - pulp sampling, screening, washing, and optical kappa number measurement.

This analyzer is ideal for determining fiber kappa for digester blow lines, pre oxygen delignification, post oxygen delignification and feed to bleach plants.

Because the SPK is dedicated to one position, it supplies kappa results at a much faster rate, 10 – 12 kappa results per hour, compared to the traditional multi point kappa analyzer's typical 2 – 3 results per hour. This will significantly improve the accuracy of the signal applied for the process control, subsequently enhancing the performance of the production process.

Installation and ownership costs can be reduced since there is no need to install and maintain the pulp transportation water valves and transport lines. Capital investment can also be spread out over time as the single high cost investment of the traditional multi point kappa analyzer can be avoided. Single Point Kappa analyzers can be purchased individually for only the most significant positions in your operation.

Use QR-code or link for more information
www.btg.com/mybtg/en/instruments/spk-5500

MEASURING PRINCIPLE / MEASUREMENT

The SPK-5500 is a single point analyzer with integrated pulp sampling, screening, washing, and Kappa number measurement (patent pending). According to the schematic illustration in Fig. 1, after sampling the fibers are transported from the upper chamber (1) through a coarse screen (2) to the lower chamber (3) for washing over a fine screen (4). The sample is then transported to the measuring cell (5) for determination of the Kappa number, being a measure of the fiber lignin content.

The Kappa number measurement is based on UV light and employs BTG's unique and well-proven measuring principle which makes calibration extremely easy and fast. The analyzer typically provides an output signal directly proportional to the Kappa number within a day after installation and start-up. A UV LED (Light Emitting Diode) light source is used providing unrivalled long-time stability and length of life.

To summarize the principle of the SPK-5500 is based on a unique, reliable and robust principle for high accuracy Kappa number measurement with high update rate which is essential for optimal proper process control.

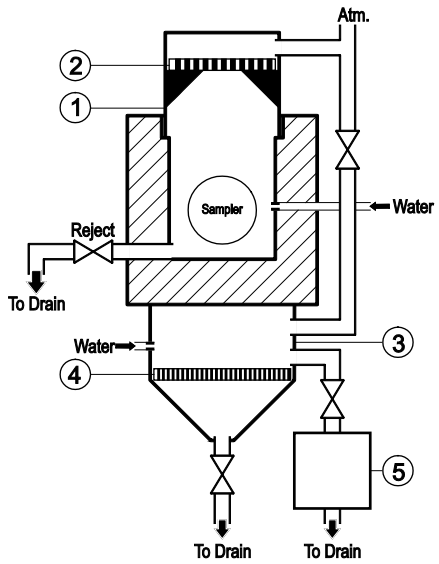


Figure 1: Schematic of SPK-5500

APPLICATION EXAMPLE

DIGESTER CONTROL

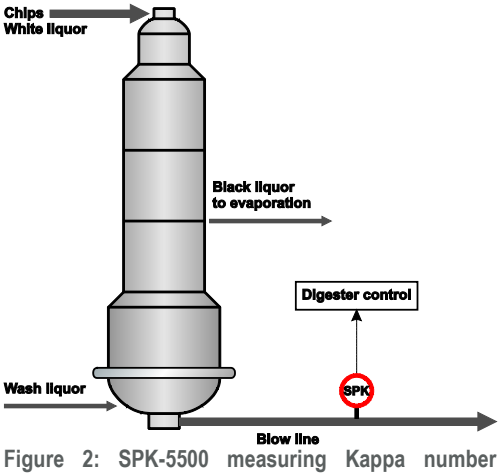


Figure 2: SPK-5500 measuring Kappa number in Continuous digester blowline

OXYGEN DELIGNIFICATION (O2 STAGE) CONTROL

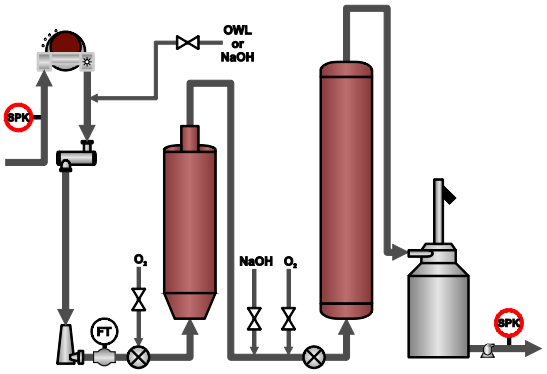


Figure 3: SPK-5500 measuring Kappa number in Oxygen delignification stages, pre- and post-O_2

TECHNICAL DATA / SPECIFICATIONS

GENERAL

Type	SPK-5500 Kappa Analyzer
Manufacturer	BTG Instruments AB, Säffle, Sweden
Measuring principle	Optical UV LED-based measurement of fiber lignin content. Combined sampling, screening, washing, and measurement in one unit
Measuring range	Kappa number 2 – 120
Accuracy / Repeatability	Depends on Kappa number level. Stated as 1σ. Accuracy 1.0 and Repeatability 0.5 at Kappa number 30. For Accuracy the uncertainty contribution from laboratory values is subtracted
Measurement update rate	4 – 6 minutes depending on process conditions
Options	Dual channel sensor for fiber lignin and HexA Cleaning system with detergent Cabinet vortex cooler

FUNCTION SPECIFICATIONS

Communication platform	CPM including input and output signals
Output signals	Fiber lignin Kappa Hexa Kappa (Option) HW/SW index Clear water value1 Clear water value2 Mean Kappa number
Digital input	Remote stop/Interlock Calibration set (see below) Remote sample
Digital output	Alarm Data ready (alt. cleaning function)
Calibration sets	Four separate calibration sets, individually programmable, and externally controllable
Diagnostics and alarms	Equipped with internal supervision for contamination detection, temperature, configuration history, and runtime.
User interface	Illuminated display and keypad on the Communication Platform (CPM).
Serial port	RS485

PROCESS SPECIFICATIONS

Process pressure square stud	PN25 (Maximum 25 bar at 20°C [360 psi at 68°F])
Process pressure round stud	Maximum 25 bar at 110°C [360 psi at 230°F] Maximum 23 bar at 150°C [334 psi at 302°F]
Media temperature	Maximum 120°C [248°F] Maximum 175°C [347°F] on request
Ambient temperature	Maximum 45°C [113°F] With optional cooler maximum 55°C [131°F]
Consistency range	2 – 16 %Cs
Flow velocity	0.2 – 6 m/s [0.7 – 20 fps]
Process pH	2 – 14

SUPPORT SYSTEM SPECIFICATIONS

Water	
Temperature	10 – 40°C [50 – 104°F]
Pressure	3.5 – 5 bar [50 – 72 psi] (depending on tube lengths)
Quality	Optically clean, maximum particle size 50 µm, air free
Consumption	3 – 4 liters/minute [0.8 – 1 USG/min] 7 – 10 liters/cycle [1.8 – 2.6 USG/cycle]
Air	
Pressure	4 – 7 bar [58 – 102 psi], filtered, dry and clean instrument air
Dew point	Maximum -30°C [-22°F]
Supply voltage	100 – 240 ±10% V AC, 50-60 Hz, Single phase to CPM Supplied with 24 V DC from the CPM
Power consumption	Max 100 VA, a 2 A slow blow fuse must be used

PHYSICAL SPECIFICATIONS

Material	
Wetted parts	Stainless steel, EN 1.4404, equiv. to ASTM 316L, SMO254, and Duplex
O-rings	EPDM or Viton
Base unit	Polycarbonate
Electronics box	Painted aluminum
Weight	
Sampling unit	22 kg [48.5 lb]
Base unit	30 kg [66 lb]
Mounting	
Min pipe diameter	150 mm [6"]

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.

YOUR LOCAL BTG OFFICE

Use QR-code or link for more information
www.btg.com/en/contact/sales-service-network

DIMENSION DRAWINGS

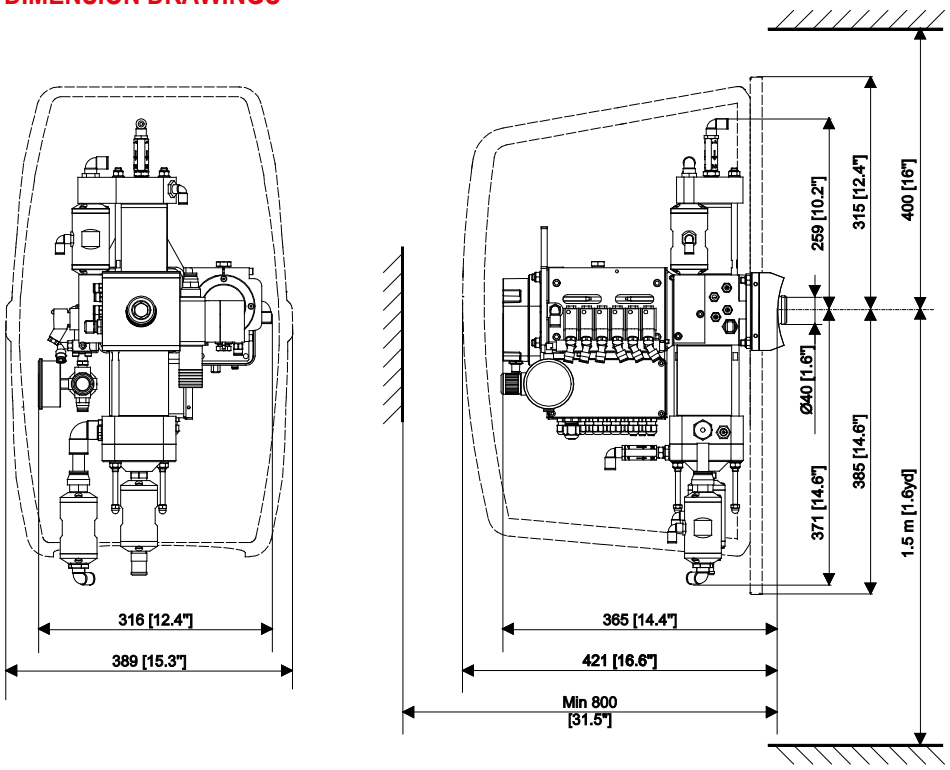


Figure 4: Sampling unit

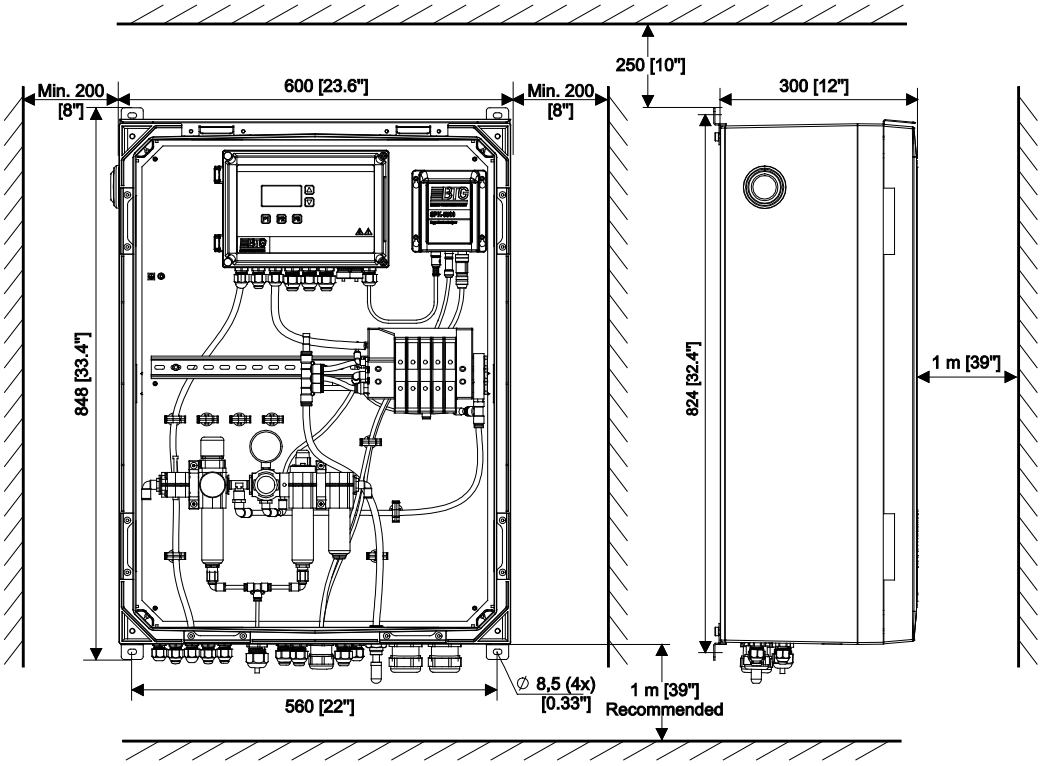


Figure 5: Base unit