Instrumentation

for Pulp & Paper Applications

The Digester/Fiber Line

The purpose of a continuous or a batch digester is to dissolve lignins from the fibers in wood chips.

The cook is performed by heating the wood chips together with sodium hydroxide and sodium sulphide to high temperatures. The bisulphides primarily break up lignin bonds to the fibres, while sodium hydroxide dissolves and extracts the lignin.

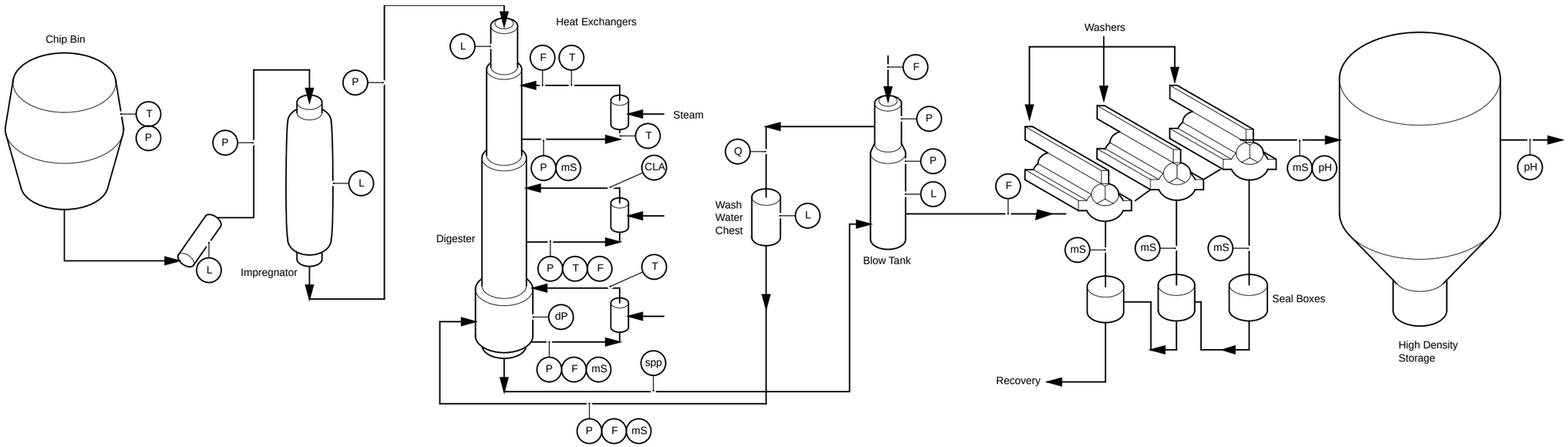
A primary goal for the cook is to produce fibers with a certain kappa number, which relates to how much residual lignin there is left on the fibers. To control the cook, it is important to keep control of all flow rates, temperatures, pressures and pH.

Mechanical treatment in the fiber line untangles fibers and is followed by the removal of non-decomposed chips (shives), stones and other unwanted particles.

Dedicated, robust instrumentation and advanced control are required to achieve this efficiently.

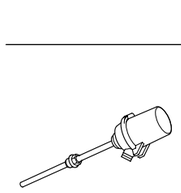
Digester – Kymmene mill Finland

ABB Automation

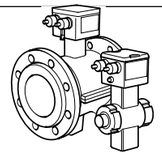


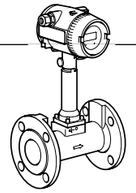
Key

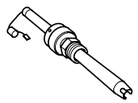
T	Temperature (SensyTemp WTR)
P	Pressure (AS 800 series, 2000T)
L	Level (AS 800 series)
F	Flow (MAG SM, TrioWirl)
mS	Conductivity (TB82EC, TB46)
CLA	Conductivity, alkali, total solids, Dissolved Lignin (CLA 2000)
dP	Differential Pressure (AS 800)
SPP	Kappa, Fibre size, NIR, (SPP)
Q	Consistency (TCA)
pH	pH (TB557, TB82pH)


SensyTemp W TR


AS 800, 2000T series

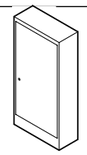

MAG SM

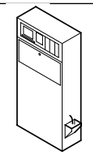

TrioWirl

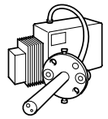

TB(X)557 pH


TB82 pH & conductivity


TB46 conductivity


CLA 2000 Cooking Liquor Analyzer


Smart Pulp Platform (SPP)


TCA Consistency Analyzer

Parameter	Why measure this parameter ?	Why use ABB Instrumentation ?	Which ABB Product ?
Flow	Optimizes flow control of chemicals, fibers and recirculation loops to minimize variation in kappa number and fiber strength. Optimizes flow control of steam in the blow tank.	AC-excited flowmeters provide inherent noise-free signal ensures stable process control, thereby improving plant output and efficiency. Rugged design reduces maintenance and extends service life.	MAG SM Electromagnetic Flowmeter TrioWirl Coriolis Flowmeter
Dissolved Lignin/ Free Alkali/ Total Dissolved Solids	Measurement during the cook enables high precision control of the Kappa number without losing fiber strength.	Measurement is carried out on-line, directly at the process pipeline – no scaling or drift problems.	SPP Smart Pulp Platform CLA2000 Cooking Liquor Analyzer
Kappa/Fiber Size	Control optimises performance of the digester and further production stages. Enables faster grade changes by fiber size detection.	Optical measurement – giving good correlation with laboratory measurements. High frequency sampling – gives a more representative view of the process.	SPP Smart Pulp Platform
pH	Detects contamination of washed pulp. Optimizes pH of pulp for bleaching and refining.	Flat surface, solid-state sensors ensure maximum process uptime. Hot-Tap retractors provide flexible installation with minimum investment. SMART-key instruments guide the user without the need for manuals.	TB(X)557 Hot-Tap pH sensor TB82PH pH/ORP Transmitter
Pressure	Correct pressure values maintained for optimum chemical reactions. Optimum control minimises large variations in product quality.	Constant accuracy maintained regardless of temperature fluctuations thus improving plant performance. Multi-process connections and special diaphragm design reduces maintenance costs and extends service life.	ASD 800 Pressure Transmitter 2020 TG Pressure Transmitter
Level	Level control of chips in the digester is important to keep conditions constant during the cook. Level monitoring ensures efficient plant operation is maintained.	Process diaphragms with special design avoid critical deposits and meet the high temperature requirements.	ASK 800 Flange-mounted Level Transmitter 2010 TD Flange-mounted Level Transmitter
Conductivity	Measurement confirms optimum washing. Detects levels of contamination in the mill condensate system. Aids maintenance of optimum overall salt balance in the entire mill system.	Self-checking enables just-in-time maintenance. Coating immunity promotes maximum process uptime. Flat face allows undisturbed measurement in pulp stock to 12% consistency. Extremely wide rangability with one sensor.	TB46 Conductivity Sensor TB82EC Conductivity Transmitter
Differential Pressure	Monitoring the performance of digester screens and stages promotes long-term efficient operation. Infra-red density measurement in digester provides improved control of Kappa number.	Multi-sensor technology saves on instrumentation and installation costs.	ASK 800 Differential Pressure Transmitter 2010 TD Differential Pressure Transmitter
Temperature	Correct temperature values maintained to ensure optimum chemical reactions in the digester.	Designed for process optimization. High reliability, repeatable accuracy and long term stability reduce service costs to a minimum	SensyTemp WTR with head-mounted transmitter

ABB Instrumentation provides:

- Application Know-how
- Full-scope Supply
- Innovative Technology
- Rugged Devices
- Global Service Support

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