

kajaaniROTARY™ – soon another industry standard

The new kajaaniROTARY transmitter expands Metso's offering in the category of shear force based consistency measurement. It is suitable especially for chemical pulp mills and bleaching applications at RCF or mechanical pulp mills. It features durability, accuracy, operability, and self-diagnostics – the well-known qualities of all Kajaani products.

Selecting a correct transmitter is a straightforward procedure when you base your decision on investment cost and measurement performance. For example, a microwave transmitter is the best choice if you are after high accuracy or total consistency measurement, or if your fiber properties often vary due to pulp grade changes. At chemical pulp mills, however, the use of microwave transmitters is sometimes limited due to the chemistry of the process.

Fiber consistency transmitters based on shear force technology have been widely used in pulp and paper applications for over fifty years. Today, they make up the majority of all consistency transmitters in operation.

Shear force technology is basically split into blade and rotating transmitters. A blade transmitter is an economical choice for most applications and provides performance similar to rotating transmitters. However, a blade transmitter's installation requirements can be challenging, especially with large process lines. For example, requirements for straight pipe sections can limit its use. kajaaniROTARY offers more flexibility in this respect and also offers better sensitivity in medium and high consistency applications than other rotary transmitters.



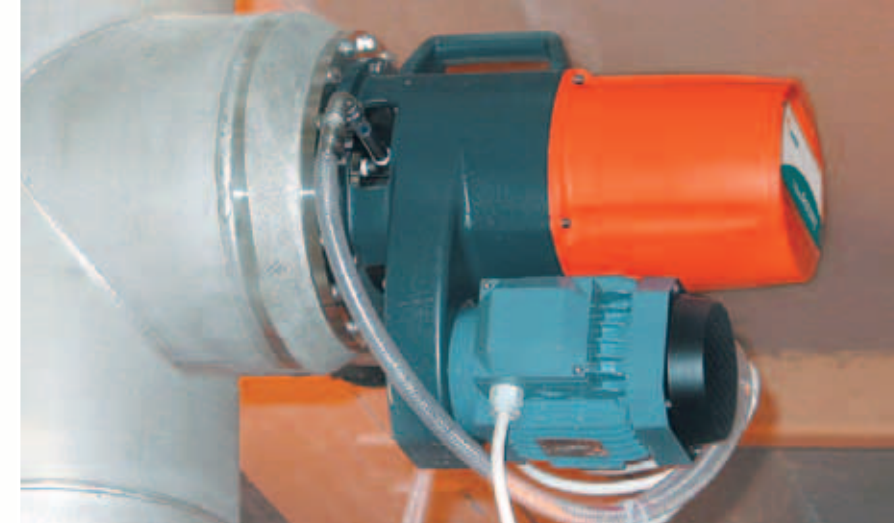
The operating unit (TCU) is an efficient tool for configuration, calibration and maintenance diagnostics.



kajaaniROTARY is available with different sensors and materials. Its wide measurement dynamics ensure excellent performance from 1.5 to 18% Cs. Wetted parts can be made of AISI 316L or 254 SMO®/Hastelloy C for bleaching applications.



Transmitter selection is easy when the required control performance is clear and the process conditions have been clarified. kajaaniROTARY completes Metso Automation's portfolio.



kajaaniROTARY can be installed using a mounting chamber (up to DN250/10" lines) or process coupling (lines DN300/12" or larger). DIN/ANSI/JIS pipe standards are supported.

Precision as never before

A robust design as well as excellent repeatability and sensitivity – these are the requirements for a superior rotary transmitter. Naturally, such a transmitter must also endure high pressure and process temperatures in harsh process conditions. The key to meeting all these requirements lies in a winning combination of precision mechanics, robust design and modern electronics.

Accurate raw measurement signals form the basis for good instrument practice. The basic performance is set and necessary compensations must be made at the early stages. In kajaaniROTARY, the ambient temperature effect is compensated, ensuring excellent performance after a cold start-up or rapid process changes.

Since the effect of rotating speed variation is also compensated, possible power supply frequency variation or random peaks in consistency at the mill do not disturb measurement either. All these factors contribute to accurate phase shift

Typical kajaaniROTARY applications:

- Chemical pulping
 - Screening
 - Washing
 - Bleaching
- Mechanical pulping and RCF
 - Bleaching

measurement.

The current controller is the heart of the transmitter, running the phase shift measurement to a fixed set point value. The adaptive controller keeps the response time constant and fast. Self-diagnostics analyzes controller performance continuously and reports all disturbances to the operator.

Current measurement is converted to torque with a resolution that is thousands of times more accurate than that of other rotating transmitters on the market. This ensures much wider measurement dynamics than ever before. Torque measurement can be converted

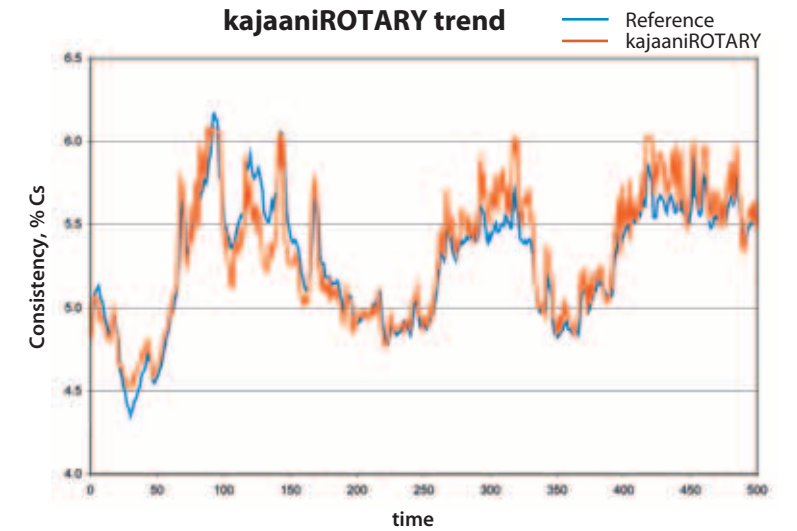
to shear force measurement after process temperature compensation. The temperature affects both pulp viscosity and fiber stiffness, which must be taken into account. Accurate and compensated shear force measurement is now ready for further calculations.

Commissioning is quick

Like all Metso Automation's blade transmitters, kajaaniROTARY is equipped with ready-made calibration curves for different sensors and pulp grades. These curves convert shear force measurement to consistency measurement. Single- or two-point calibration can be made for quick commissioning. Versatile multi-point calibration is available for special pulp grades and MC consistencies.

Self-diagnostics – of course

Today, self-diagnostics is a must. The instrument must be able to analyze its own performance continuously and report it to the control room or the asset management system. kajaaniROTARY features a complete DTM description for



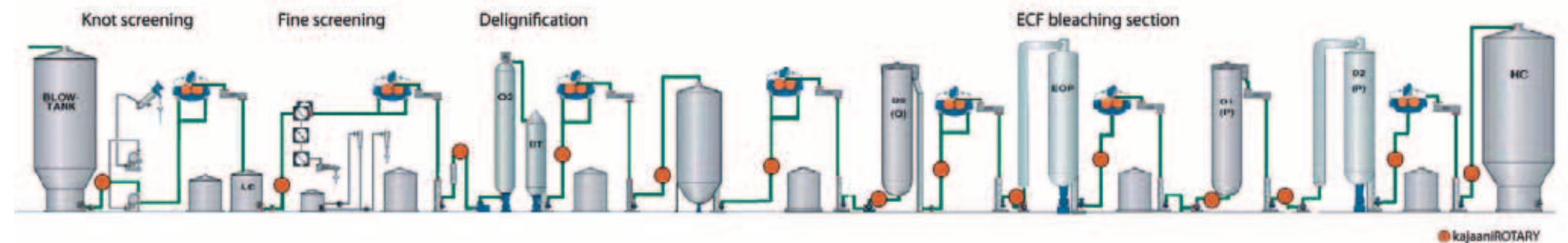
The performance of kajaaniROTARY vs. the best-selling shear force transmitter applied to a washer after the O₂ stage at a chemical pulp mill.

be customized to different applications. the FieldCare™ system, making all relevant measurement data such as consistency, temperature, rotating speed and performance diagnostics available for the users. Since the alarm and warning limits are adjustable, the transmitter can

be customized to different applications.

kajaaniROTARY's maintenance diagnostics provide service staff with access to all raw measurement data and detailed diagnostics.

Typical kajaaniROTARY applications at a chemical pulp mill include washing, screening and bleaching. Accurate washing and screening control ensures maximum production capacity with high quality pulp. The role of consistency control in bleaching is critical when you aim at optimal chemical dosing. Consistency control also forms the basis for upper level bleaching controls.



Specifications and process conditions

Measuring range	1.5...18% Cs (see table below for more specific data)
Repeatability	0.01% Cs
Sensitivity	0.001% Cs
Damping	1...60 s
Ambient temperature	-20...+70 °C (-4...158 °F)

kajaaniROTARY sensors:

Sensors	See table below for more specific data
Enclosure class	IP66 (NEMA4X)
Housing	Aluminum alloy
Wetted materials	AISI 316L, 254 SMO® or Hastelloy C276 Mechanical seal: AISI 316L, Hastelloy C276 Wetted gaskets: EPDM, Kalrez

Operating unit, TCU:

Enclosure class	IP65 (NEMA4)
Operating voltage	90...260 VAC/0.1A
Outputs: current output	Consistency 4-20 mA + HART® 18...35 VDC
Inputs	2 inputs, isolated 12-48 VDC
Communication:	PC connection: RS-232 Profibus PA: 2005 Foundations™ Fieldbus: 2006 Support for FieldCare: 2005

Motor:

Enclosure class	IP55 (optional IP56)
Motor voltage	220-690 VAC/45-65 Hz (see technical specification for more details)

Process conditions:

Process temperature	0...+120 °C (+32...248 °F)
pH range	1.5-13
Pressure rating	PN10/PN25 (150/363 lbs.)
Vibration	Max. 20 m/s ² , 10-200 Hz

Measurement range (% Cs) for different pulp types and sensors

Sensor type	TM		PL		PM		PH	
	Min	Max	Min	Max	Min	Max	Min	Max
SW	1.5	6.5	5	11	7	13	9	15
HW	1.6	7	5.5	12	7.5	14	10	16
GW	1.7	7	6.5	13	8	14	11	16
TMP	1.7	7	6.5	13	8	14	11	16
RCF	1.8	8	7	13	8.5	15	12	18

254 SMO® is a registered trademark of Outokumpu Stainless
HART® is a registered trademark of Hart Communication Foundation



Metso Automation Field Systems Consistency Products

Lentokentänkatu 11, P.O. Box 237
FI-33101 Tampere
Finland
Tel. +358 20 483 170
Fax +358 20 483 171

For further information please contact one of
our regional offices, or visit our web site
www.metsoautomation.com

**Metso Automation Inc.
Head Office**
Tulppatie 1, P.O.Box 310
FI-00811 Helsinki
Finland
Tel. +358 20 483 150
Fax +358 20 483 151

North America
2900 Courtyards Drive
Norcross, GA 30071
USA
Tel. + 1 770 446 7818
Fax +1 770 441 9652

Latin America
Av. Independência, 2500-Iporanga
18087-101, Sorocaba-São Paulo
Brazil
Tel. +55 15 2102 9700
Fax +55 15 2102 9748/49

Asia Pacific
238 A Thomson Road
#25-09 Novena Square Tower A
307684 Singapore
Tel. +65 6511 1011
Fax +65 6250 0830

Middle East
Roundabout 8, Unit AB-07
P.O. Box 17175
Jebel Ali Freezone, Dubai
United Arab Emirates
Tel. +971 4 883 6974
Fax +971 4 883 6836

www.metsoautomation.com

Standard delivery content:

- Transmitter
- TCU with a sensor cable (10 m)
- Mounting kit
- User's manual

Options:

- Process chambers
 - Process couplings
 - Blind flanges
- (See the technical specification sheet for more information)

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kajaaniROTARY™
Get a better view of consistency control

