

MEK-2500 RotoForce™

Rotating Consistency Transmitter



FEATURES

- Rotating shear force measurement using force balance transducer with a feedback function
- Versatile
- Reliable and well proven
- Precalibrated at delivery

BENEFITS

- Excellent accuracy, high signal to noise ratio, and reproducibility provides best sensitivity and very high long term stability with a minimum of hysteresis. Ideal for critical applications
- Can be used for almost all types of consistency measurement
- Requires a minimum of maintenance, even in the most demanding applications
- Quick and easy to start up

GENERAL

The MEK-2500 is a versatile consistency transmitter that can be optimised for many different applications using different components. The transmitter is suitable for applications in the entire process from the blow line after the digester, in screening and washing stages, and in the bleach plant through to the machine chest before the paper machine.

The rotating shear force measuring method means the transmitter is virtually insensitive to normal variations such as in fiber composition, freeness, fillers, black liquor content, flow velocity, air content, and pressure.

The MEK-2500 is an intelligent, microprocessor-based transmitter which is fully operated using the CPM-1300 Communication Platform. Calibration and transmitter settings can easily be documented via a SD-card.

Communications with a Distributed Control System are made by means of a superimposed signal according to standard HART® protocol. The transmitter is connected with a two-wire system for analog output. Power is supplied by a local power supply mounted in the Communication Platform.

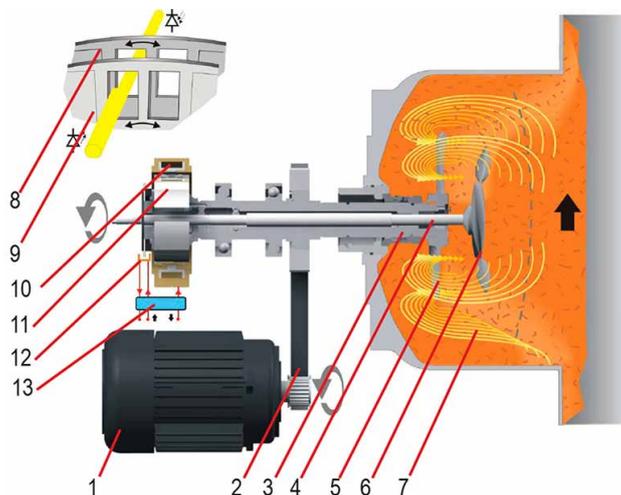
A HART® Device Description (DD) enables full configuration of the MEK-2500 using a Universal HART terminal or a PC-based AMS software.

The MEK-2500 is the 4th generation of rotating transmitters from BTG, and is based on the successful and widely proven MEK rotating transmitters, sold in more than 16.000 units. This transmitter provides even greater flexibility as a single model covers the entire consistency range, as well as improved stability, lower maintenance requirements and longer life time.

MEASURING PRINCIPLE

Shear force measurement using force balance principle. A shaft system is belt driven from a synchronous electric motor. The shaft arrangement consists of an inner-measuring shaft (4) which rotates, within a few degrees of arc, independently of the outer-drive shaft (3). The outer-drive shaft has a propeller (5) which draws a continuous pulp sample past the sensing element (6) connected to the measuring shaft. As the sensing element in the pulp fiber network rotates it produces a torque which retards the measuring shaft relative to the drive shaft.

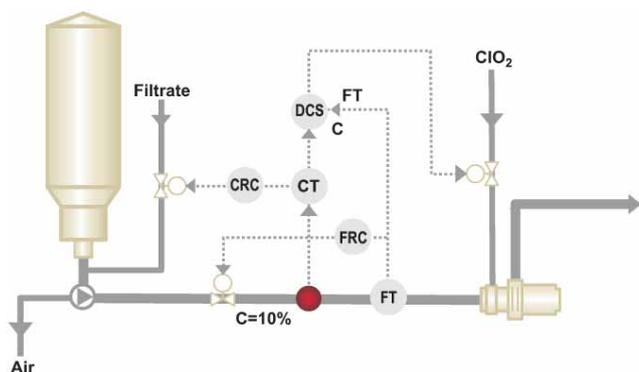
The transmitter detects the degree of retardation and produces a feedback force to counter balance the torque generated by the pulp fiber network. The torque/angle between the shafts is fed back and balanced to a constant value via an electromagnetic feedback system. The signal is then transformed to an output signal (4-20 mA) which is calibrated and linearized automatically against laboratory test values. Calculations and conversions are made in the unit's microprocessor. The transmitter is delivered precalibrated as standard and no further calibration is needed.



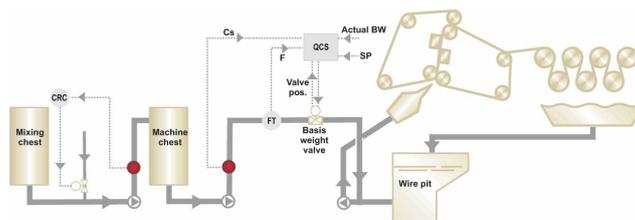
1 Electric motor; 2 Gear belt transmission; 3 Outer drive shaft; 4 Inner measuring shaft; 5 Propeller; 6 Sensing element; 7 Measuring chamber; 8 Notched wheel on drive shaft; 9 Notched wheel on inner torque shaft; 10 Feedback coil; 11 Pole shoe; 12 Optical sensor measures angular displacement; 13 Electronics

APPLICATION EXAMPLES

BLEACH PLANT CONSISTENCY CONTROL:



PAPER MACHINE CONSISTENCY CONTROL:



BTG reserves the right to make technical improvements.

TECHNICAL DATA

| | | | |
|-------------------------------|---|--------------------------|--|
| Type | MEK-2500 in-line rotating consistency transmitter for pulp suspensions | Power consumption | Max 200mA at 24VDC |
| Manufacturer | BTG, Säffle, Sweden | Calibration sets | Four separate calibration sets, individually programmable, and externally connectable using a binary-coded switch. |
| Measuring principle | Shear force measurement using force balance transducer | Alarm function | Provides alarm signal on low and high consistency levels, drivebelt runtime, and unstable signal. |
| Consistency limits | 1 – 16% fiber consistency | Protective rating | Equivalent to IP65, NEMA4x |
| Repeatability | Better than $\pm 0.3\%$ of full scale deflection under stable operating conditions | Communications | Keypad and display on the Communication Platform. Universal HART terminal or PC based AMS software via HART® communication |
| Flow limits | 0.5 - 5 m/s [1.6 - 16.1 fps] | Electric motor | Squirrel cage 3-phase motor, 0.3 kW 4-pole insulation class F, wide voltage motor, all voltages |
| Process Conditions: | | | |
| Process Pressure | 10bar [145 psi], 16bar [230 psi] or 25bar [360 psi] depending on selected transmitter components | | |
| Media temperature | Max. 150°C / [300°F] Min. 15°C / [60°F]. | | |
| Ambient temperature | Transmitter: Max. 60°C / [140°F] Electronic box: Max. 50°C / [122°F] | | |
| Material wet parts | Stainless steel equiv. to EN 1.4404/ ASTM 316L or Avesta 254SMO or Hastelloy C depending on application | | |
| Electronics: | | | |
| Output signal, analog | 4-20mA. Galvanically isolated. Current limited to min. 3.9 and max. 20.5 mA. Loop load signal: Voltage supply/load 24 VDC | | |
| Output signal, digital | Superimposed signal over 4-20mA current loop according to HART® protocol | | |

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