

Product sheet

MEK-3000 TwinTorque™

Rotating Consistency Transmitter

FEATURES

- Rotating shear-force measurement with improved force-balance principle
- Versatile
- Single-phase power supply, small pipe connections
- Small and light, pre-calibrated at delivery
- Reliable, smart, and compact construction

BENEFITS

- Excellent accuracy and repeatability, no hysteresis; ideal for critical applications
- Can be used for almost all types of consistency measurements
- Low installation cost
- Easy installation, quick start-up
- Low maintenance, self-diagnostic

GENERAL / BACKGROUND

The MEK-3000 TwinTorque takes in-line, rotating, consistency measurement state-of-the-art to a new level. Combining the most robust measuring method with the unique TwinTorque technology results in unrivalled performance in a format providing significantly reduced installation and maintenance costs. The transmitter is supplied by single-phase power via the Communication Platform (CPM). In new installations the small flange version yields minimized pipe connections, while the large flange version fits to the conventional studs and measuring vessels.

The versatility of the MEK series is retained with the new MEK-3000. Hence, it can be optimized for every application in the entire process; from the blow line after the digester, in screening and washing stages, and in the bleach plant through the machine chest. Its total flexibility is accompanied with ultra-high measurement precision with a construction providing extreme compactness, minimized maintenance requirements, and longer life time.



The MEK-3000 is operated using the CPM, which ensures compatibility with present and future communication interface requirements, from analogue output with HART® to field buses.

The MEK-3000 is the fifth generation of rotating transmitters from BTG, and is based on the successful and widely proven MEK rotating transmitters, sold in more than 30,000 units. Bringing BTG's unsurpassed experience and success with rotating consistency measurement together with the TwinTorque technology thus creates new opportunities in consistency measurement and control.



Use QR-code or link for more information
www.btg.com/mybtg/en/instruments/mek-3000

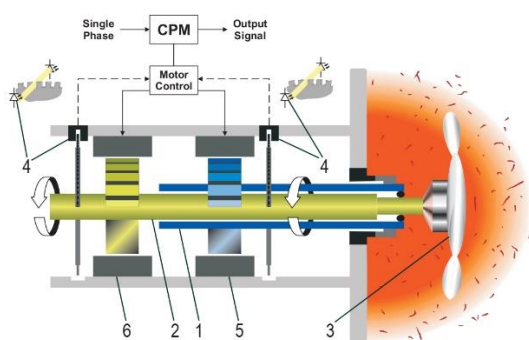
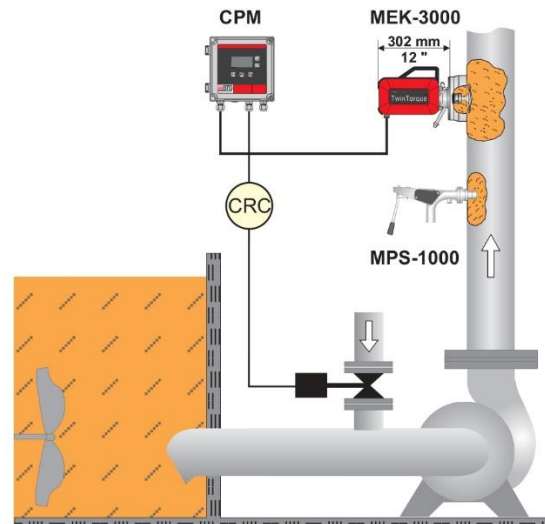
MEASURING PRINCIPLE / MEASUREMENT

Rotating consistency measurement is based on measuring the reaction torque (or shear-force) from a sensing element, which has a strong physical relation to the fiber consistency. The accepted technology comprises a double-shaft system with an outer hollow-shaft (1) and an elastically connected inner (measuring) shaft (2) on to which the sensing element (3) is attached. The outer shaft is driven by a motor, and for achieving long-term stability and minimum sensitivity to disturbances, a feed-back system counterbalances the reaction torque at the sensing element keeping the measuring shaft in a controlled position within the hollow-shaft.

The MEK-3000 TwinTorque takes advantage of an improved system following the principle of force-balance (patented). A so-called direct drive of the sensing element is achieved by applying a second motor for driving the measuring shaft and sensing element attached to it. The two motors are driven individually but at exactly the same rpm, with a controlled angular displacement, measured by optical encoders (4). Exploiting the total controllability and perfect relationship between the torque and current of the motors (5,6), which are of brushless permanent magnet type, results in extreme precision and accuracy in the torque – and consistency – measurement.

APPLICATION EXAMPLE

Typical control loop for consistency control, using the MEK-3000 TwinTorque™:



- 1 Outer shaft
- 2 Inner (measuring) shaft
- 3 Sensing element
- 4 Optical encoders
- 5 Motor on outer shaft
- 6 Motor on inner shaft (for consistency measurement)

TECHNICAL DATA / SPECIFICATIONS

GENERAL

Type	MEK-3000 in-line, rotating, consistency transmitter for pulp suspensions
Manufacturer	BTG Instruments AB, Säffle, Sweden
Measuring principle	Rotating shear force measurement
Consistency limits	1 – 16% fiber consistency
Repeatability	$\sigma = 0.002\%$ Cs
Flow limits	0.5 - 5 m/s [1.6 - 16.4 fps] depending on application
Process Pressure	PN16 (16 bar at 20 °C, [230 psi] at [68 °F] with Ø270 mm flange PN25 (25 bar at 20 °C, [360 psi] at 68 °F] with Ø180 mm flange
Media temperature	Min. 15 °C [60 °F] Max. 120 °C [248 °F]
Ambient temperature	Max. 50 °C [122 °F] without cooler Max. 60 °C [140 °F] with cooler
Material wet parts	Stainless steel equiv. to EN 1.4404/ASTM 316L or Avesta 254 SMO depending on application
Protective rating	Equivalent to IP65, NEMA4x
Weight	15 kg [33 lb] with Ø180 mm flange 19 kg [42 lb] with Ø270 mm flange
Functions:	
Calibration sets	Four separate calibration sets, individually programmable, and externally controllable using a binary-coded switch

Alarms and diagnostics	Motor and electronics supervision, high/low temperature and load levels, etc.
User interface	Illuminated display and keypad on the CPM
Mounting	Mounted to the pipe through a measuring vessel or a weld-in stud depending on pipe size and transmitter flange type
Transmitter flange	
Ø180 mm	Min 200 mm [8"] pipe using weld-in stud or saddle
Ø270 mm	100-250 mm [4-10"] pipe using measuring vessel, min 300 mm [12"] using weld-in stud
Communication platform	For information about the CPM, including input and output signals, see the CPM product sheet PS2026
Electrical connection	100-240±10% VAC, 50/60 Hz, Single phase. One connection to the CPM for both power supply and communication
Power consumption	Maximum 320 VA

SAFETY & DIRECTIVES

EU-directives

Designed in accordance with relevant CE standards.

Quality Assurance

Quality-assured in accordance with ISO 9001.

YOUR LOCAL BTG OFFICE



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