High-precision in-line viscometer FEM-1000V series

Detect viscosity of the liquid by the change of the vibration. Using a piezoelectric acceleration sensor, and achieve high resolution. It is a revolutionary product that uses the resonance phenomenon. By adopting an oscillator with an unique balanced structure, we have achieved the long-term reliability and stable viscosity measurement.

Patented (Japan, U S and UK)

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•FEM-1000V is a torsional oscillation viscometer of inline process applications. You can measure the viscosity and temperature in real time and continuously by attaching tank or pipe with the flange.

It is a maintenance-free viscometer due to using a piezoelectric ceramic in the driving unit.
Viscosity sensor portion (probe) has become a full sealed structure, non-explosion proof type is also

possible to soak in the liquid the entire probe addition to being attached with the flange.

●It is possible to viscosity measured in flow state of liquid by attaching to the pipe that the flow of the liquid and the tank is agitated.

•Explosion-proof type holds a flameproof, you can use in the controlled area with confidence.

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•Viscosity measurement accuracy is within \pm 1% of measured value. This means that the measurement accuracy is within 1% that even a 800mPas even 1mPas.

•Probe is waterproof and dustproof structure compact and robust. In addition, it is made of stainless steel resistant to corrosion. Also, because the wetted parts are welded all, it is superior to confidentiality and excellent washability.

•The viscometer measures with high accuracy[]±1] of measured value[]by adopting bidirectional balanced oscillator[]patented[]without being affected by vibration process.The probe can be set vertically, horizontally or obliquely to the flow direction.

It does not have to require installation adjustments to the distortion or the like mechanical stress at the time of installation.

•Measured viscosity data of high measurement accuracy within $\pm 1\%$ of the measured value is possible to output through 4-20mA (analog output), or RS232C (digital output). Therefore, it is the optimum viscometer for production management for automation line.

•Flameproof compliant standards are as follows.

Carios	Probe	Flamonroof	Type examination number	
Series	Slave controller	Flameprool		
FEM-1000V-EX Series	FVM80A-PEXG	ExdIICT6	TC18354	
	FEM-1000-EXSC	ExdIIBT6	TC18851	

FEM-1000V-EXMT Series	FVM80A-PEMT	ExdIICT3	TC18356
	FEM-1000-EXSC	ExdIIBT6	TC18851

•The oscillation frequency of Controller with PLL circuit is always controlled to equal the resonance frequency of the vibrator. It measures viscosity accurately even when the resonance frequency of the vibrator changes due to effect of temperature.

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Decentralization and Dispersion

Management of ink, paint, various coating, and film formation

●Slurry, Food

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•Our viscometers are torsional oscillation, constant shear stress systems driven by a piezoelectric ceramic source as actuator.

●It vibrates, in the direction of rotation.2 identical inertial masses drive part 11 and detector 12 at the both ends of the torsion rod of vibration unit. The system measures viscosity resistance at a viscosity detector as the amplitude of vibration by acceleration sensor located at the upper mass and converts it into viscosity.

●The node of the resonance in the center of the torsion rod [node]patented[is the non-moving point, and the upper and lower inertia mass[]1, I2[]vibrates in an oppsite direction each other[]the bidirectional balance type oscillator[]. It does not matter the installation location of the probe by Node and also an installation adjustment by the mechanical stress distortion when installing, isn't required.

•A torsion rod is welded to a base of a probe housing through atorsion pipe, and it is the perfect sealed structure.

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Applicable to sticky slurry, strong acid, strong alkali.	×
¥ It is one of the ways when you are installing a viscometer to pipe in food lines, etc.	×

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Various	Ferrule	sizes	are	available

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The detector can be installed at any angles of Flow due to adopt the balance type vibrator with piezo electric ceramics as a driving source.

* Left diagram example indicates a mounting and does not intend to reguire a plurality of probes.

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TYPE Inline viscometer FEM-1000V-ST FEM-1000V-MT FEM-1000HV Input type Probe Flameproof Slave / controller L range 0.50[]1000mPa[]s 10.0[]5000mPa[]s Measuring Range M range 500[]20000mPa[]s H range HV range 1.00[100Pa[]s ±1%(Reading) L range ±1%(Reading) M range Accuracy H range Viscosity ±1%(Reading) HV range ±1[] F.S L range ±1%(Reading) ±1%(Reading) M range Repeatability ±1%(Reading) H range HV range ±1[] F.S 0∏70°C 0[]150°C Measuring fluid temperature range Temperature Range 0[]100°C 0∏180°C 0□180°C Calibration with Standard Liquids for Calibrating Viscometers (JIS Z8809-2011) Calibrating method Viscosity and temperature each 4~20mA any setting output (output resolution 16bit) And RS232C interface output output 10[]40°C, 20[]80%RH(No condesation) System requirements Power AC100[240V 50[60Hz FVM80A-PMT FEM-1000-PMT Probe Model FVM80A-PST Equipment configuration FEM-1000V-STC Controller model Probe \Leftrightarrow controller connection cable L = 5m Controller power supply cable L = 2.5m Other Option

ТҮРЕ		Flameproof inline viscometer			
Input type		FEM-1000V-EX	FEM-1000V-EXMT	FEM-1000HV-EX	
Flameproof Slave / controller		Exd II CT6	Exd II CT3	Exd II BT3	
		Exd II BT6	·		
		L range	0.50[]1000mPa[]s		-
	Manauring Danga	M range	10.0[]5000mPa[]s		-
	Measuring Kange	H range	500[]20000mPa[]s		-
		HV range	-		1.00[]100Pa[]s
		L range	±1%(Reading)		-
	Accuracy	M range	±1%(Reading)		-
Viscosity	Accuracy	H range	±1%(Reading)		-
		HV range	-		±1[] F.S
		L range	±1%(Reading)		-
	Depentability	M range	±1%(Reading)		-
	Repeatability	H range	±1%(Reading)		-
		HV range	-		±1[] F.S
	Measuring fluid temperature range		0[]70°C	0∏150°C	0⊡150°C
	Temperature Range		0[]100°C	0□180°C	0[]150℃
Calibrating method		Calibration with Standard Liquids for Calibrating Viscometers (JIS Z8809-2011)			
	output		Viscosity and temperature each 4~20mA any setting output (output resolution 16bit) And RS232C interface output		
	System requirements		10[]40°C, 20[]80%RH(No Condensation)		
Power		DC24V			
		Probe Model	FVM80A-PEXG	FVM80A-PEMT	FEM-1000-PEMT
Equipment		Controller model	FEM-1000-EXSC (slave controller) / SMC-1000V (master controller)		
configuration		Other	Cable connected to probe L = 5m Three flameproof gasket 3pieces		
Option		-			