OpreX™ Field Instruments | Flyer

Measuring the Impossible When Nothing Else Will Work

Magnetic Flowmeter CA Series

YOKOGAWA
Co-innovating tomorrow™

The benefits range from reducing slurry or process noise, to eliminating potential leak paths. Built for high-coating processes.

The magnetic flowmeter CA series measures the un-measurable with the ability to meter fluids with conductivity as low as 0.01µS/cm. The non-wetted capacitive electrode plates, which are mounted on the outer surface of a ceramic flow tube and not in contact with the fluid, are capacitively coupled to the fluid.

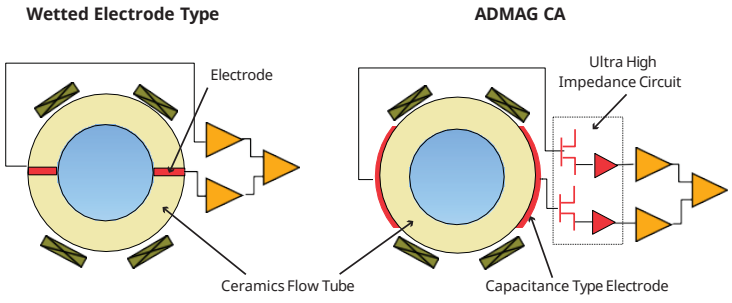
In addition, the CA series employs an advanced high-frequency excitation method. This revolutionary design is an excellent alternative to other flow technologies, as it can provide accurate, reliable measurement of low-conductivity liquids such as pure water, as well as a coating process, flows, and high-concentration slurries.

Figure 1. Magnetic Flowmeter CA Series

Advanced Technology

Ultra-Low Conductivity Measurements

Capacitance type electrodes and very high impedance amplifier of CA series make ultra- low conductive fluid measurement possible. This combined technology allows the CA flowmeters to measure fluids with conductivity levels as low as 0.01µS/cm.



High-Frequency Excitation

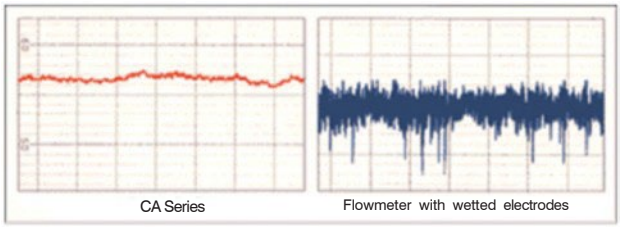
The CA Series uses High Frequency Excitation to make it possible to reliably detect fluid electromotive force with minimal effect of fluid noise.

Accuracy Specification

The CA series offers a high accuracy of up to 0.5% of flow rate.

Non-Wetted Electrodes

The CA series utilizes a non-wetted electrode design, instead electrode pick-up plates are placed on the measuring tube to pick up and measure the electromotive force.



The non-wetted electrodes create an excellent opportunity for use in chemical and slurry applications as it is not affected by the corrosion, coating, and abrasive issues associated with wetted electrodes.

Ceramic Liner - Excellent on Corrosive Fluid and Abrasive Fluid

Ceramic liner tubes have many advantages over fluoropolymer (PFA/PTFE) or other liner materials like rubber. Yokogawa uses alumina ceramic (Al_2O_3) for its ceramic liner tubes, which demonstrates excellent characteristics for a broad range of applications.

The Alumina ceramic (Al_2O_3) used in the ADMAG CA has a purity of 99.9%.

These properties of the ceramic liner provide:

- Excellent insulating characteristics
- Excellent resistance to abrasion, ensuring accurate measurements even with highly abrasive slurries
- Excellent resistance to corrosive fluids
- Excellent durability under high temperature and high-pressure conditions without additional metal tube

Coating Resistant

Non-wetted capacitive electrodes can measure electromotive force through capacitance including coating insulating material, offering steady measurement. Field-proven applications such as latex, reclaimed oil, hot spring water, red mud, and dye which had been difficult in the past to measure using conventional magmeters are now possible by utilizing the CA series. The following figure compares the outputs of measurement between a wetted electrode type and the magnetic flowmeter CA series when there is grease on the inside of the tube.

Mirror Finished Surface

By means of a special magnetic polishing process, the inner surface of the ceramic liner tube can be given a mirror finish. This polishing method is advantageous in eliminating problems such as abrasive irregularities and dull edges and will reduce the coating effects of your process. The mirror-finished ceramic liner tube has a surface roughness of Ra 0.1 µm.

Size mm (Inches)	15 (0.5) - 200 (8)
Excitation	High frequency
Flow span m/s (ft/s)	0.5 (1.64) -10 (32.8)
Min. fluid conductivity (µS/cm)	As low as 0.01
Protection	IP66/IP67, Type 4X (CSA)
Hazardous area classification	FM, Explosionproof (USA)
Accuracy	±0.5% of flowrate (Depends on nominal pipe size and fluid conditions)
Repeatability	± 0.1% of flowrate (1 mm/s min.)
Lining material	Ceramic
Electrode Construction	Non-wetted plate electrodes installed on outside of ceramic tube
Fluid pressure	-0.1 MPa to 4 MPa: Ceramic lining size 50 mm or smaller -0.1 MPa to 2 MPa: Ceramic lining size 80 mm or greater
Fluid temperature	-10 deg C to 120 deg C
Process connection	ASME Class 150/300, EN PN10/16/40,GB PN10/16/40, JIS F12, 10/20K: Wafer
Output signal	4-20 mA DC, Pulse/Status output (Type E only: Status input, Pulse/Status output 2)
Function	HART communication, Verification, Diagnostic, micro SD card
Indicator	HART communication, Verification, Diagnostic, micro SD card
Power supply voltage	AC:100-240 V AC 50/60Hz, DC:100-120 V DC AC:24 V AC 50/60Hz, DC:24 V DC
Maximum power consumption	13 W

Note 1: The accuracy of a product before shipment is defined as totalized value at the result of the calibration test in our water actual flow test facility.
Note 2: For a fluid with large flow noise (pure water, pure alcohol or others), or a fluid with low conductivity and low viscosity, the output fluctuates and is impossible to measure accurately.

OpreX™ Through the comprehensive OpreX portfolio of products, services, and solutions, Yokogawa enables operational excellence across the enterprise.

Trademarks Co-innovating tomorrow, OpreX and all product names of Yokogawa Electric Corporation in this bulletin are either trademarks or registered trademarks of Yokogawa Electric Corporation. All other company brand or product names in this bulletin are trademarks or registered trademarks of their respective holders.

YOKOGAWA ELECTRIC CORPORATION
World Headquarters
9-32, Nakacho 2-chome, Musashino-shi, Tokyo 180-8750, JAPAN

http://www.yokogawa.com

YOKOGAWA CORPORATION OF AMERICA	http://www.yokogawa.com/us/
YOKOGAWA EUROPE B.V.	http://www.yokogawa.com/eu/
YOKOGAWA ENGINEERING ASIA PTE. LTD.	http://www.yokogawa.com/sg/
YOKOGAWA CHINA CO., LTD.	http://www.yokogawa.com/cn/
YOKOGAWA MIDDLE EAST & AFRICA B.S.C.(c)	http://www.yokogawa.com/bh/

Subject to change without notice.
All Rights Reserved, Copyright © 2023, Yokogawa Electric Corporation