

ADMAG AXR[®]

Next Generation Two-wire Technology



Why two-wire?

When the first magmeter was introduced to the market in the mid 1950s, it was thought that measurement stability could only be achieved with a large excitation current, something that is only possible with a four-wire device. In recent years, however, interest in two-wire magmeter technology has increased due to the need to save energy. The ADMAG AXR was developed to meet both needs, consuming just 1/80 to 1/100 the power of conventional four-wire flowmeters while delivering the same high level of measurement stability.

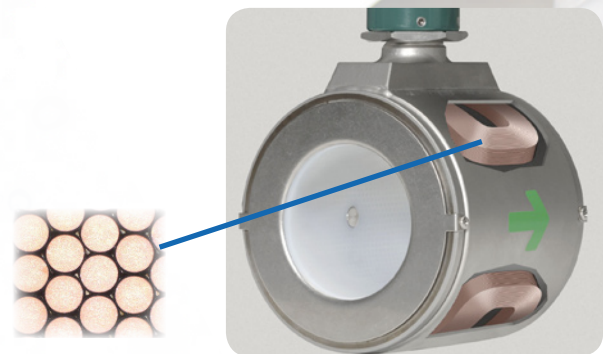
Key technologies

Dual frequency excitation

Dual frequency excitation is a unique Yokogawa technology that combines the flow noise immunity from high excitation frequencies with the excellent zero stability from low excitation frequencies. This technology realizes a high signal to noise ratio and enables the reduction of excitation current to fulfill the power requirements of two-wire technology

Super high density coil

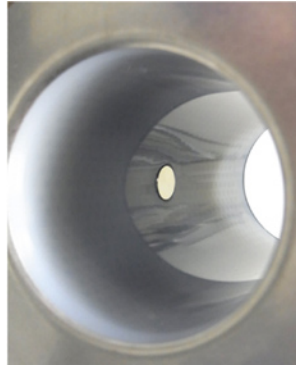
To generate a strong magnetic field with reduced excitation current requires an increase in the number of coil turns. Yokogawa utilizes a super high density coil with a regular alignment that has 1.5 times the number of coil turns of the conventional four-wire AXF. In addition, the carefully aligned winding contributes to the generation of a well-distributed magnetic field and improves measurement linearity.



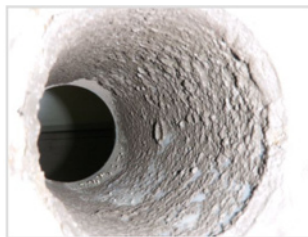
Super high density regular alignment coil

Special surface finished electrodes mirror-finished PFA liners

Special surface finished electrodes and liners reduce the flow noise that is typically generated when media flow over a rough surface. Special manufacturing techniques give the AXR liner a smoothness of $Ra \leq 0.1 \mu\text{m}$ that reduces flow noise. Adhesive process fluids are also less likely to adhere to the smooth liner. The following pictures show the fluid coating on two flow tubes used in the same process.

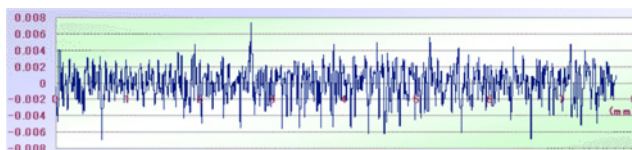


[AXF]

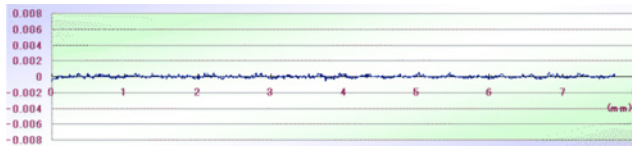


[AXR]

[Sample test result]

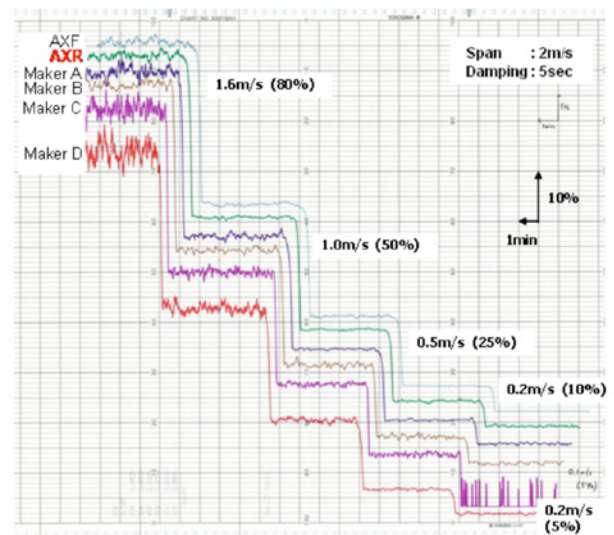


Roughness of 1.33 μm of super PFA (standard)



Roughness of 0.09 μm of super PFA (mirror finished)

Thanks to the design features described above and the use of a unique electric circuit design with DC noise immunity, the AXR two-wire magmeter delivers the same excellent process and flow noise resistance as a four-wire device. With low velocity flows and light slurry fluids that normally would degrade the S/N ratio, the AXR achieves stable output. It is the first two-wire magnetic flowmeter with the reliability required for use in control loops.



User benefits

Energy saving (initial costs/operating costs)

According to the actual calculations of an AXR user in the USA, the expected savings from replacing a four-wire device with the AXR is \$1000 to \$2000 in initial costs and \$15 in annual operating costs. The replacement of a mechanical two-wire flowmeter with the more energy efficient AXR also significantly reduces energy loss and operating costs.



The AXR can reduce annual CO₂ emissions from 73 kg to 1.4 kg