



# NOBODY SAID Designing Utility Meters was Easy



Utility Meters lead a tough, lonely life. Gas and electricity meters are baked in summer, frozen in winter, and rarely visited by a meter reader now that automatic meter reading (AMR) is so pervasive. The water meter spends its life in the corner of a damp basement, the dripping monotony relieved only by an occasional burst of flow information from its radio transmitter, and the distant prospect of a visit from a service technician in ten years time to change its battery. Clearly designing utility meters presents challenges.

Despite the tough environment, utility meters have to work reliably, measure accurately, present no safety hazards, and resist the attempts of unscrupulous energy thieves bent on fooling them into underestimating utility usage.

**“Coto’s switches are the most rigorously tested in the industry, with 100% factory testing of every switch for amp-turn closure sensitivity and contact resistance stability.”**

Coto Technology CT10 Reed Switches operated by permanent magnets play a vital role in many utility meter designs. Their great advantage is they consume no power, and are switched magnetically without any physical contact through inspection covers, intrinsic safety barriers, and tamper-proof enclosures.

Most water and gas meters have no power source except a battery in the case of AMR-equipped systems. This eliminates the use of magnetically-operated switches such as Hall Effect or GMR that consume electrical power, leaving the reed switch as the only useful contender for systems demanding years of battery life.

Pulse counting is a typical reed switch application. A magnet-equipped rotary pointer activates one or more reed switches on each revolution, accurately measuring gas or water flow. The ability to detect reverse flow is important; this can be done with two reed switches using quadrature detection, where an incorrect pulse sequence shows the meter is operating in reverse. This indication can be transmitted automatically by an AMR system so fast corrective action can be taken. An adjacent third switch can be used to detect theft-of-service attempts with an external magnet. Other reed switches may be used for calibration or programming.

Pairing the right switch with the right magnet involves knowing the closure sensitivity of the switch (in amp-turns), the dimensions and field strength of the magnet, and the distance between them. Coto’s applications engineers can help with these choices, including correct orientation of the switch and magnet. Not all reed switches are created equal; Coto’s are the most rigorously tested in the industry, with 100% factory testing of every switch for amp-turn closure sensitivity and contact resistance stability.

Reliably designed utility meters reduce expensive service calls, loss of utilities, and consumer complaints. That reliability can be enhanced by rugged, encapsulated reed switches like Coto Technology’s surface-mount CT10 series, that has a demonstrated mean life of well over a billion switching cycles at typical signal switching loads.



*To find out how Coto can aid you in your design efforts, please contact us at the web address below.*

