

INSIGHT

Capturing system water pressure readings using digital recorders

As anyone running a water system knows, summer is the peak time for water usage. That also makes it the optimum time for collecting system pressure readings for pipe pressure monitoring and leak testing. Accurate pressure data allows system operators to reduce leakage volumes, energy costs, system maintenance costs, customer complaints and water quality problems. It can also be useful information for determining available remaining capacity in the system's distribution lines and for comparing to or calibrating the accuracy of the system's hydraulic model.

Understanding pressure readings

Fluctuations in pressure can affect the physical integrity of pipes, and surges can create leaks and main breaks. The very minimum pressure under all conditions of flow is 20 psi. Any pressures less than this are unacceptable because they can create conditions for potential back-siphonage, contamination of the water supply system and air locks.

The advantage of taking pressure readings during the summer months is that there is a greater chance of collecting data when the system is stressed and under peak conditions. Due to increased water demands across the system, tank levels may be dropped lower, pumps will run longer and at full capacity and head losses in the pipelines will increase. Pressure monitoring throughout the system during these conditions will provide data that better details the system's low-pressure areas, limitations and better matches the hydraulic model. Typically, a hydraulic

model will analyze the system under peak conditions with full flows assigned to all users. Pressure data collected during high usage summer months is more accurate for comparison with the model and provides tangible data detailing the extent of pressure problems in the system and remaining system capacity.

Digital pressure recording devices

The wide-spread availability of digital pressure gauges with automatic data logging make collecting pressure readings easier than ever. A variety of manufactures sell data logging pressure gauges. For example, the LEO Record by Keller measures and records pressure and temperature readings at user-defined intervals up to one measurement per second. The instrument will record up to 57,000 data points and store them in a secure memory unit until they are retrieved via a computer running Keller's logger software.

At the higher end of pricing and for a more permanent use, Mueller has designed a remote pressure monitoring system called Hydro-Guard. The pressure monitor can be installed in a vault or meter pit application by connecting to any existing ¾" NPT connection. The monitor can also be installed along any existing pipeline. In this application the pipeline is exposed, a tapping saddle is installed, and the pressure monitor is connected to this saddle. While this pressure monitor is not very portable, once installed, it can be a useful way to continuously and remotely monitor the system.

The Mueller Hydro Guard can record samples at user specified intervals even down to every millisecond. However, for most rural water systems, taking a measurement every few minutes is adequate. A few other recording systems to consider include the LOGiT LPT, Dickson PR350 and Monarch Track-It. These are all around $500 dollars or less per unit, are rated for outdoor exposure and record pressures that can be downloaded to a USB Drive.

The value of pressure readings

Pressure management helps save money. Regardless of what type of recorder a water system decides to use, collecting pressure readings helps to examine low water pressure complaints, locate water pressure spikes and even provide water distribution system modeling data.

To explore pressure recording system options and discuss how to use the information collected to determine a system's remaining capacity or calibrate the system's hydraulic model, contact a Bartlett & West water engineer.