

Saving time and money with TU5300 turbidimeters at one of Italy's most important water suppliers

Problem

The Italian utility company, Nuove Acque Spa, had over 150 online turbidimeters. Each one needed a routine cleaning, maintenance, and calibration. Nuove Acque Spa needed turbidimeters with less maintenance and calibration requirements in order to reduce management costs.

Solution

Nuove Acque Spa adopted the Hach® TU5300 turbidimeters with innovative 360° x 90° Detection technology. The TU5300 only requires cleaning every 1-3 months, while other maintenance tasks can be performed annually or as needed.

Benefit

By adopting turbidimeters with 360° x 90° Detection technology, which requires less cleaning and maintenance, Nuove Acque Spa could significantly reduce their management costs, while utilising innovative measurement technology to provide accurate results.

Introduction

For years, the Italian utility company, Nuove Acque Spa, has pursued a policy of constant improvement in regards to customer service. This means providing clean water for domestic, commercial and industrial use. Part of that commitment includes accurate online turbidity monitoring. Nuove Acque is responsible for the turbidity monitoring of 50 water treatment plants and over 500 smaller, more remote water sources. To achieve this level of turbidity monitoring, Nuove Acque installed over 150 measuring points scattered throughout the province of Arezzo and in parts of Siena (Tuscany). These measuring points are mainly comprised of Hach SC200 controllers and 1720E turbidimeters installed at plant entrances and on the distribution network. All turbidity measurements are managed remotely via displays, reporting, and warning alarms.

Maintenance and Calibration Service

To maintain the 150 measuring points, staff carried out a scheduled cleaning, maintenance, and calibration service using a van equipped with spare parts, reagents and calibration standards. The maintenance and calibration were quantified at 4.5 hrs./instrument/year – not including nonroutine maintenance.



TU5 Calibration Vials

The solution and benefits for the client

The TU5300 only requires cleaning every 1-3 months, while other maintenance tasks can be performed annually or as needed. In addition, TU5 series turbidimeters are equipped with a smaller measuring cell in both size and volume, which, in reducing the sample residence time, results in shorter event detection times and much faster response times. With less online sample surface area to clean, sealed vials for calibration, and the elimination of the need for indexing and silicone oil in the lab, these turbidimeters require less maintenance and calibration.

The innovative 360° x 90° Detection technology is a patented optical design that sees more of your sample than any other turbidimeter, delivering the best low-level precision and sensitivity while minimising variability from test-to-test. Shown in Figure 1, 360° x 90° Detection utilises light from a laser that intersects the sample vial from below, maximising the sum of stray light that is measured which reduces the errors caused by scratches or condensation. The same optical design is implemented in the TU5 lab and process instruments to achieve matching lab and online measurement results

TU5 series turbidimeters can also be equipped with a range of accessories to dramatically reduce cleaning and maintenance operations; specifically, the flow sensor reports low or no flow and the automatic cleaning module eliminates the need for operator intervention, ensuring that the instrument is always in the best condition for operation. It's this technology that allows Nuove Acque Spa to cut back on maintenance and calibration costs.

Field testing the TU5300

In early 2016, the water treatment plant for the city of Arezzo was the first plant in Italy to test the TU5300 with ACM (Automatic Cleaning Module) in parallel with a 1720E turbidimeter. The comparison field test between the two analysers lasted several months. During this period, the reliability of measurements, the performance of the integrated flow sensor, the option to use the automatic cleaning system, and the speed in carrying out cleaning operations and calibration procedures with sealed vials, impressed all.

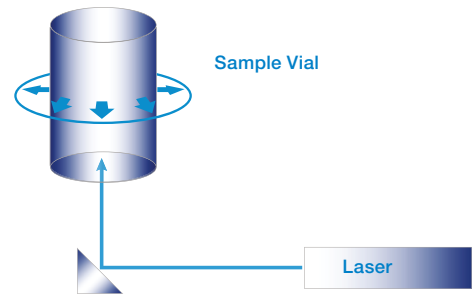
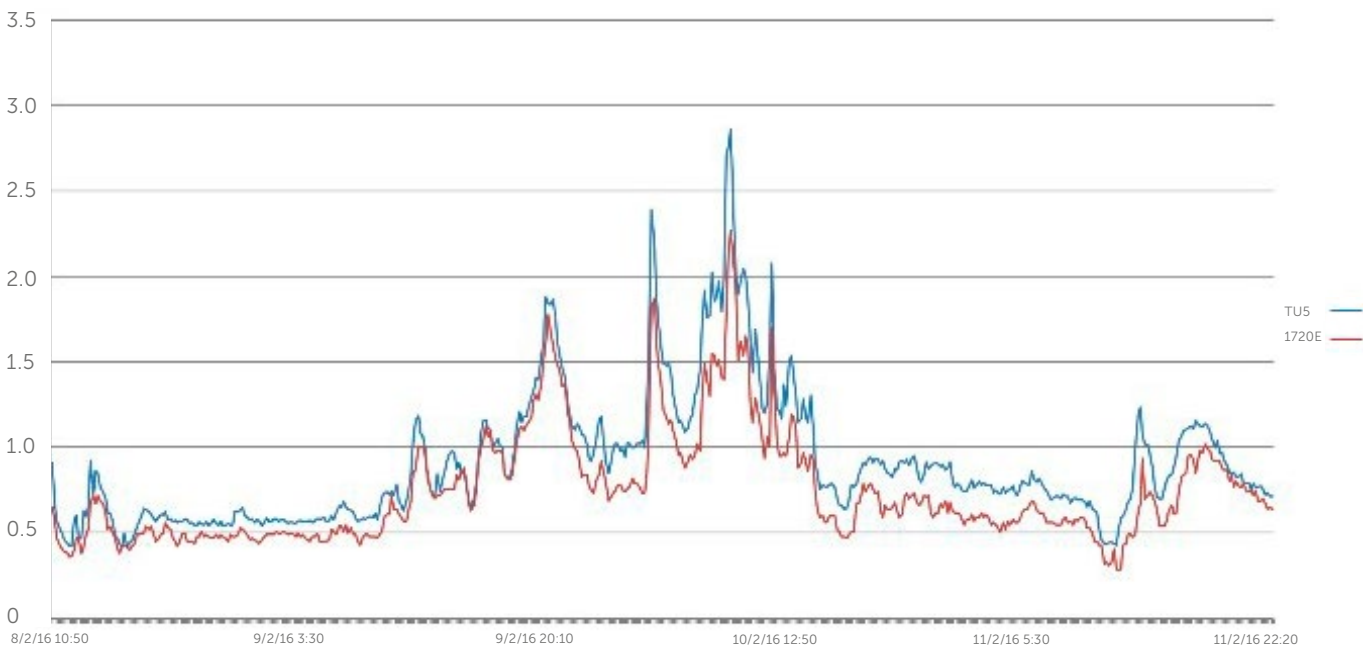


Figure 1 – The 360° x 90° Detection technology directs a beam of light into your sample, which is then read at 360 degrees of detection for highly accurate and repeatable measurements.



Turbidity measurement comparison between TU5 and 1720E

Choosing the TU5 Turbidimeter

The tests, conducted on both filtered water with a turbidity of less than 0.1 NTU and on water from a settling tank with values up to 3 NTU, provided reliable results. The ACM proved to be a useful accessory in reducing staff cleaning operations, particularly in situations of abnormal turbidity peaks that occur in small rural springs.

The TU5 is able to identify sudden changes in flow because the integrated flow sensor ensures a more stable and bubble-free flow, which is essential for cell measurements.

The dry-air retention system guaranteed the absence of condensation throughout the test period, along with the System Check feature, which proved to be ideal for scheduling maintenance operations on installations at remote sites.



1. TU5300sc with ACM
2. TU5 with SC200 controller
3. Turbidity measurement comparison between SC200 controller and a portable measuring instrument

Conclusions

Thanks to the comparative field test, the client could find solutions to long-standing problems concerning maintenance and calibration requirements. The new TU5 series of turbidimeters enable:

- Maintenance to be kept to a minimum, allowing optimization of field interventions
- Greater measurement and instrument reliability thanks to the presence of the flow sensor and cleaning module
- Simpler calibration procedure thanks to the absence of formazin and the use of sealed vials

For these reasons, the company decided to continue its program of innovation by implementing new measuring points and updating obsolete or defective instruments, using the Hach TU5 Turbidimeter as the standard.