Laboratory Water System for Medical Research, UK

Scientific | Case Study

The Client

The Client is the School of Medicine at one of the UK's leading research universities. The School carries out cutting edge research into asthma, allergy and respiratory science at a facility based in a major teaching hospital.

Key Figures

• Ultrapure Type I water for research laboratory

• Type III water for glass washing and autoclave feed

The Client's Needs

The research facility occupies one floor of the hospital and uses Type I ultrapure water (18MΩ.cm resistivity, organics <10µg/l TOC and bacteria <1cfu/ml) for critical analytical work. The existing water system consisted of two ELGA PURELAB Prima 60 units which treated the mains water supply to Type III quality and delivered it to a 5,000 litre storage tank.

From here it was pumped via an ageing ring main to 18 points of use each fitted with a PURELAB Maxima polisher to upgrade the water to Type I. The ring main needed constant maintenance and the Maxima units, though still performing reliably, were obsolete. Annual operating costs for the system were around £5,000. As part of a laboratory refurbishment, the university wanted to reduce operating costs and improve efficiency.

The Solution

Veolia Water Technologies's solution was to relocate a PURELAB Prima to each of the two washrooms along with a 75 litre storage tank. This feeds a new, short, cross-linked polyethylene (PEX) ring main supplying Type III water to a glass washer, an autoclave and one of the Maxima polishers.

PURELAB Option-Q

To provide ultrapure water in the two laboratories, they installed **PURELAB Option-Q purifiers which produce Type 1 water directly from mains water, eliminating the old ring main and its maintenance problems, whilst minimising costs.**

Re-using the existing Prima and Maxima systems helped to keep costs low. The total annual operating costs for the new washroom systems is reduced to just over £1,000, so the investment will be repaid **within three years.**

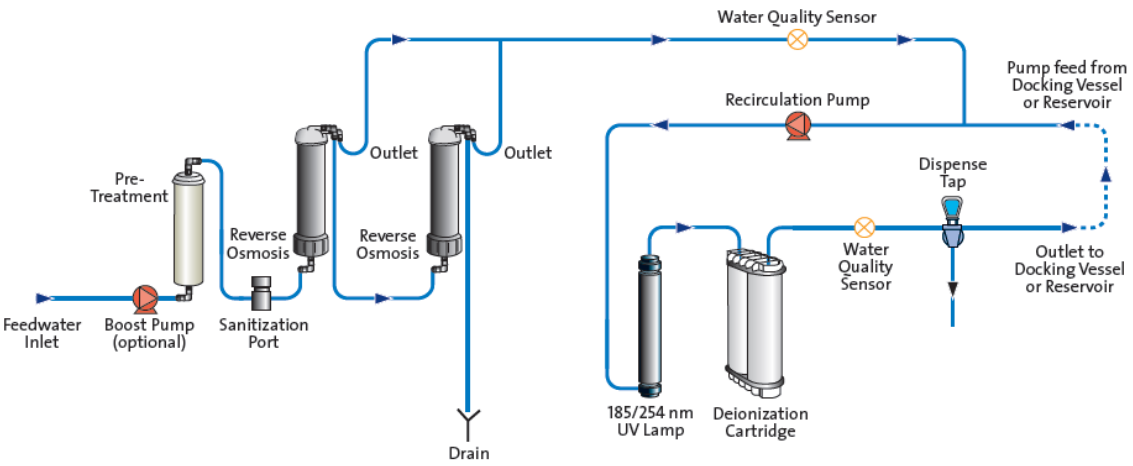
Laboratory Water System for Medical Research, UK

Process Description

In the PURELAB Prima, mains water is filtered and then passes through a break tank to comply with water bye-laws and is then pumped through low pressure, high rejection reverse osmosis membranes which reject at least 90% of dissolved salts, 99% of organic contaminants, bacteria and particles. The resulting permeate meets Type III quality, that is resistivity >0.05MΩ.cm, organics <200µg/l and bacteria <1000cfu/ml. The membranes have a long life and operating costs are therefore low.

Reverse osmosis is also the first treatment step in the PURELAB Option-Q but the permeate is then further treated by recirculation through a UV lamp and deionisation cartridge. The UV lamp generates 184 and 254nm radiation, a combination which combines oxidation of trace organic matter and disinfection. The final deionisation cartridge uses high quality mixed cation and anion exchange resins to remove dissolved ionic impurities to the Type I specification..

Process Flow PURELAB Option-Q



The Benefits

- Reduced operating costs provide savings of £4,000pa
- High efficiency new purification technology
- Low maintenance PEX distribution system

Veolia Water Technologies
Windsor Court, Kingsmead Business Park,
High Wycombe, HP11 1JU
Office. +44 (0)1628 897000
www.veoliawatertechnologies.co.uk