



Wafer Flange Sensor will not disturb flow.

Typically, the sensor is mounted between the pump intake flange and the pipe flange, although alternate sensor styles and mounting locations may be applicable. The system monitors for the presence and/or absence of fluid in a process line or pump. Under normal operating conditions the pipe will be full of fluid. The sensor will read a high capacitance. When the fluid level drops in the line, the capacitance will lower and the sensor will indicate an alarm condition. The control unit relay will switch to provide a visual alarm, signal a control system, or directly shut down a pump.

Sensing plates are embedded into a wafer flange which provides monitoring without any intrusion into the flow stream. The product has an adjustable time delay and sensitivity to eliminate nuisance alarms which could be triggered by the presence of bubbles. Possessing PVC wetted parts for corrosive environments, an intrinsic safety barrier can be provided for the monitor, so that it can be used in hazardous locations.

The ring flange sensor is designed in accordance with the ANSI ISO # sizing specifications and can be mounted in a vertical or horizontal position. With no moving parts this rugged and reliable product is easy to install and provides an economic solution for operators.

For further information on this or other water quality instruments, please contact Action Instrumentation & Control Pty Ltd. Tel: 07 3395 5936, Fax: 07 3395 5509, Email: sales@actioninstruments.com.au.

### NEW TECHNOLOGY BOOSTS AUSTRALIA'S PIPELINE CONSTRUCTION SECTOR

The traditional method of pipeline construction in Australia has been

somewhat stagnant for the past thirty years where only continual refining of the dig-lay-bury method has been utilised in the hope of gaining efficiency.

Pipe and Civil is bringing game changing technology to the pipeline industry where direct ploughing technology as previously used in the fibre optic rollout has been scaled up to provide solutions for the flexible pipes in the pipeline industry.

According to Pipe and Civil Director, Brenton Euler, the company has purchased this Australia-first ploughing technology to become the largest pipeline and cable ploughing contractor in Australia and will soon be the largest worldwide.

"Pipe and Civil are always looking for better ways to deliver our service, now by applying this technology and customising it to the local requirements we have once again set ourselves apart from the pack and are positioned as a leader in the Coal Seam Gas Upstream Gathering innovation," said Mr Brenton Euler. (Upstream Gathering includes the pipelines that usually consist of two gathering pipelines linking the well-head to the main water and gas pipelines. The gathering pipelines feed into the main trunk line which conveys gas from outlying gas wells to the main compressor plant.)

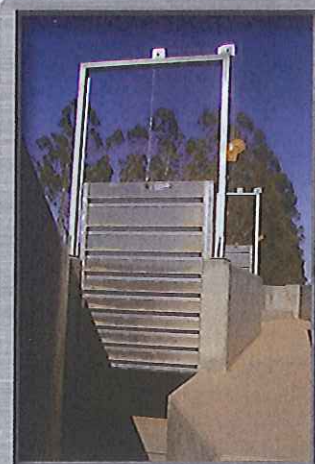


"This new pipeline system will be more cost efficient due in Australia to production capability. It's also safer due to the lack of open trench and it also reduces the environmental impact when compared to current pipeline burial methods.

"A reduced construction easement combined with lower levels of soil disturbance is a win for the environment and the landowners," said Mr Brenton Euler.

This has all come from a small innovative Brisbane-based construction company that has experienced unparalleled growth on its way to competing at the large end of town while winning the Lord Mayor's Business award along the way.

## PENSTOCKS & STOPBOARDS



- Modular Structures
- Best Practice Designs
- Complete System Control
  - Custom Designed
  - Reduced OH&S Risks
  - High Strength, Low Maintenance Design
- Manual or Automated
- Operational Flexibility

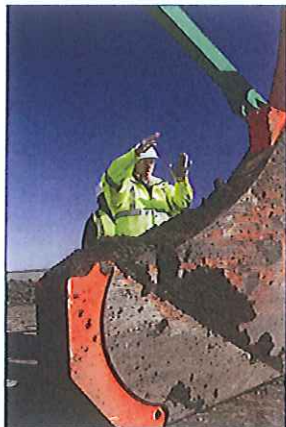
**awma**  
Water Control Solutions

DESIGN  
MANUFACTURE  
INSTALL

Ph 1800 664 852

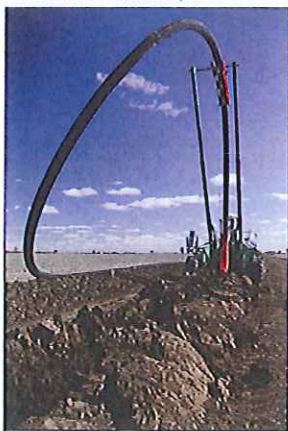
www.awma.au.com





The arrival of the first FSP 220 "Fockersperger" from Germany has been hotly anticipated. Evidence of this can be seen as the highest executives of the major energy companies, government authorities and irrigators travelled from all parts of the country to witness the first field presentation of the FSP 220 in Australia in July.

"Pipe and Civil is leading the way once again with innovative solutions for the coal seam gas industry. We are now bringing to the market what has evolved from a couple of solid years of research and planning," Mr Euler said



"While this system is now creating a groundswell of interest in the gas and water sectors, Pipe and Civil had the foresight to put its money where its mouth over 12 months ago, illustrating that we are leading the way."

Contact: Sheela Aiyasamy, P: (07) 3262 4600, F: (07) 3262 6448, M: 0450 585 731, E: sheela@pipeandcivil.com.au, www.pipeandcivil.com.au.

## UV SOLUTIONS FOR WATER SCARCITY

Jennifer Muller, Adam Festger, Kenny Khoo, Wayne Lem

Water scarcity is a growing issue in many regions around the globe. Reuse of treated municipal wastewater offers an

attractive solution to water stress. The use of ultraviolet (UV) technology has been successfully implemented for the purpose of providing disinfection and environmental contaminant treatment (ECT) in water reuse applications.

### Disinfection for Water Reuse

Reuse water is treated wastewater that has been disinfected to very stringent standards in order to protect public health and to ensure environmental sustainability. UV does not form disinfection byproducts such as THMs, HAAs and NDMA. Furthermore, UV is effective against chlorine-resistant pathogens like *Cryptosporidium*. Reuse water is typically treated to tertiary levels using sand filtration or membrane filtration prior to disinfection.

Both open channel (gravity flow) and closed vessel (pressurised) UV systems are currently used in reuse applications. Open channel reactors are often installed in existing chlorine contact chambers, thereby eliminating the need for major civil work, thus reducing installation costs (Figure 1). With the rising use of membrane bioreactors to provide high quality treated water for reuse applications, many plants are producing pressurised effluent which needs to be disinfected via a closed vessel system (Figure 2).



Figure 1. This 732 L/s (16.7 MGD) water reuse plant installed an open channel UV system.



Figure 2. Four closed vessel reactors were installed post-membranes for this 894 L/s (20.4 MGD) water reclamation plant.

### Chemical Contaminant Treatment with UV-Oxidation

Beyond general water reuse for irrigation or non-potable uses, there is a growing trend toward indirect (IPR) of wastewater. The term "indirect potable reuse"

describes injecting treated water into groundwater aquifers or by releasing it into surface water reservoirs for future withdrawal. An obstacle to the potable use of this water has been the presence of chemical and biological contaminants not easily removed by conventional treatment processes.

Worldwide, a number of plants that are performing IPR utilise a treatment train that consists of membranes (typically microfiltration and reverse osmosis) followed by UV for environmental contaminant treatment. The combination of UV-photolysis and UV-oxidation within a UV system destroys chemical contaminants such as nitrosamines, pharmaceuticals and other industrial contaminants that can be present in reuse water. The UV-oxidation reaction is illustrated in Figure 3.

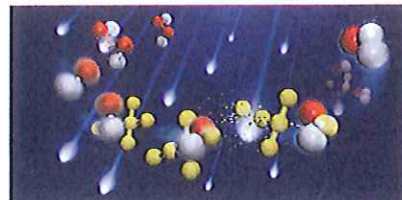


Figure 3. The UV-oxidation process requires the combination of UV and hydrogen peroxide. UV light forms hydroxyl radicals (red and white) from hydrogen peroxide (upper left). The hydroxyl radicals rapidly react with chemical contaminants (in yellow) within the UV reactor.

Numerous large IPR facilities worldwide, including the Groundwater Replenishment System, an IPR facility located at the Orange County Water District (OCWD) in California, USA (Figure 4), and the Western Corridor Recycled Water Scheme in Brisbane, QLD utilise UV-oxidation to ensure the highest quality water. UV-oxidation serves to treat contaminants that, due to their small molecular size, can pass through even the most advanced RO membranes (e.g. NDMA).



Figure 4: The Orange County Water District's 4381 L/s (100 MGD) Groundwater Replenishment System employs UV-oxidation as a final barrier for pathogens, nitrosamines, pharmaceuticals, industrial chemicals and other contaminants.

### A Sustainable Source of Water

Reuse of wastewater, now recognised as an ecological and economic necessity, is