

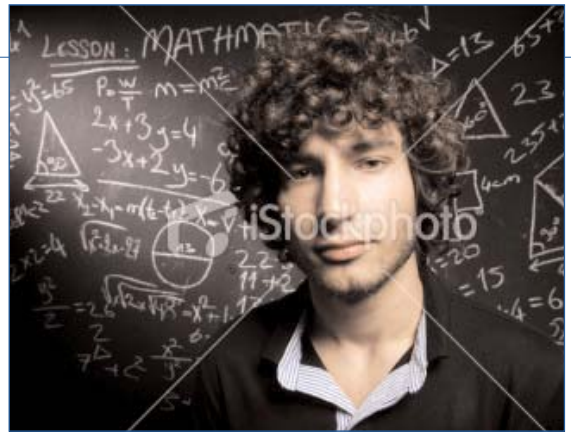
ARMSTRONG



Building Schools for the Future

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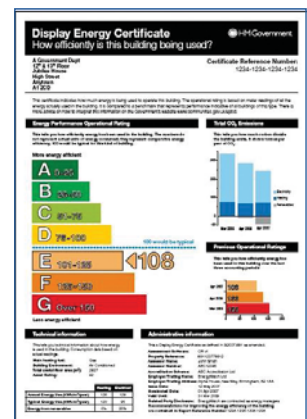
'Green' should not impact reliability, installation costs or public spending



When building new schools or retrofitting existing schools there is immense pressure to conform to energy legislation - yet historically standard mechanical plants appear to be installed due to lack of imagination or budget restraints.

This has a great impact on energy cost and the obligation to meet carbon targets. Perhaps there has been a lack of awareness regarding potential products within the market place.

Armstrong would like to show that 'GREEN' should not impact the reliability, installation costs and more importantly public spending.



► Problems

- High energy costs coupled with existing power available results in long term high running costs and greater public spending without any power available for upgrades
- Difficulty in retrofit installations and integration of new products in systems results in long and expensive retrofit installations with unreliable system dynamics
- Higher Maintenance and life cycle costs result in higher running costs for the long term and greater public spending
- Not meeting carbon obligations and providing high impact to DEC certificates results in non compliance to legislation and becoming a bad example to the private sector
- Unaware of new energy efficient products as well as small size of specialised companies results in unrealised potential of savings and impact on long term support

► What Schools Need

- Lower energy costs and maintenance costs resulting in lower public spending
- Guaranteed system performance
- Meets Carbon Obligation with DEC large improvements
- Proven product history with full support

► Benefits Provided By Armstrong

- Lowest energy costs
- Guaranteed system performance
- Lowest maintenance costs
- Legislation compliance
- Proven product history

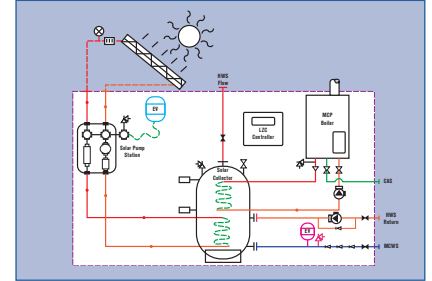
Schools for the Future

► Armstrong Product Solutions

Packaged Solar/Biomass Plantrooms

Armstrong has the first pre-engineered solar heating solution designed to produce DHWS at 60°C with gas fired condensing boiler back up. A Bio-mass option is available, integrated with gas fired boilers to provide variable and constant temp circuits at max efficiency.

- Meets all part L requirements and is the most efficient/energy efficient plant solution
- Prefabricated off-site resulting in less site restrictions and reliable product
- LZC package has been designed to give lowest



MBS - Integrated Heating

The Armstrong MBS is a fully integrated heating system for medium sized applications. The modular design means that it can be assembled in 45 minutes. The optimised controls, combined with variable flow condensing boilers, offers 95% efficiency.

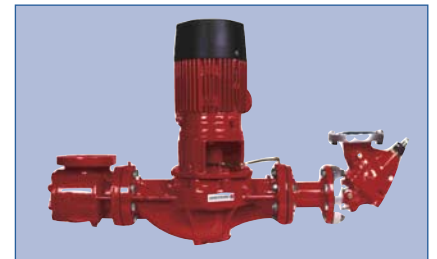
- The most energy efficient boiler system on the market with large NOX savings – Dramatic effect on EPC Certificate
- MBS is quite simply the easiest retrofit solution, installation in 45 minutes
- As a packaged system maintenance is core benefit
- Operating costs are the lowest in the industry



Vertical In-Line Pumps

The Vertical In-line pump is one of the most efficient and space saving products in the market. Vertical In-Line pumps save 50% of installation costs with no inertia bases, vibration mounts or flexible connectors. Seals can be changed in 30 minutes without removing the motor.

- Reduction in plant room piping combined with trimming the impeller impellor shaving to load results in 40% energy savings
- 40% space saving compared to conventional base mounted pumps
- Open seal arrangement gives 40% maintenance savings
- 10% life cycle costs compared to conventional pumps



IVS Sensorless Pumps

Completely integrated pump, drive and control system. Wall mounted VFD and wiring costs are eliminated. The IVS Sensorless pump is self controlling - A truly remarkable and industry leading product.

- Save up to 70% of energy consumption at 50% flow – Drastic improvement for EPC Certificate
- Very easy to retrofit and no base requirements
- No maintenance required on critical components
- Reduces life cycle costs by up to 65%



IPS Pumping Control System

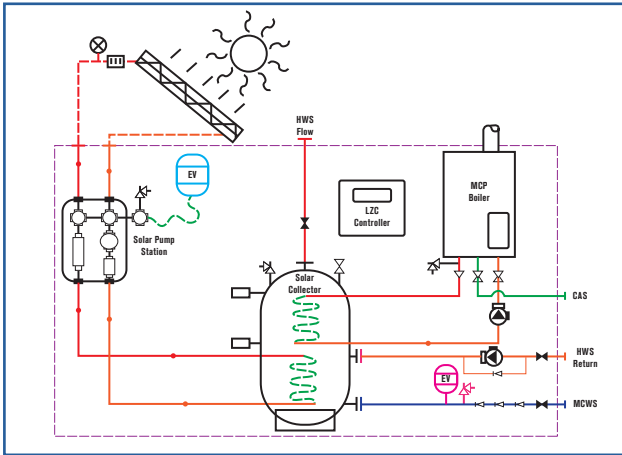
Pre-engineered factory-built pumping control system. No BMS system can achieve the same level of energy management as the IPS.

Each IPS system is configured for each specific set of project requirements and will save on design and components.

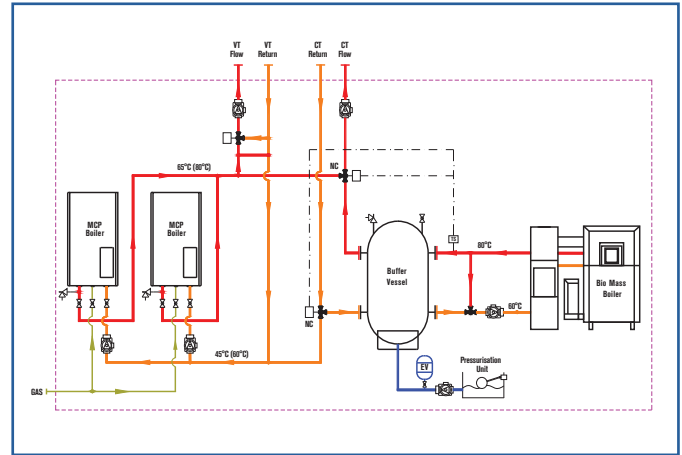
- Up to 70% saving compared to constant flow systems, large reductions in EPC rating
- The simple addition of VFDs and IPS is a quick and easy way to retrofit and modernise an entire system.



► Packaged Renewable/Sustainable Solutions as Standard



Solar Heating System



Biomass Heating System

► Calculation Tools

► IPC Chilled Water Energy Calculator :

The IPC chilled water energy calculator is a very powerful tool and can determine comparisons between standard chiller systems and IPC, giving differences in COPs, kW/hr, kg/Co2 and cost.

► IVS Energy Saving Calculator:

IVS sensorless automatically marries the system to the pump curve and offers great energy savings and especially suited to retrofit applications. The Calculator gives operating costs of the systems as well as payback.

► Verticalc

Vertical In-Line pumps in conjunction with Suction guide & Flotrex valves make substantial savings on pipe work, inertia bases, valves and general installation. Verticalc is an outstanding tool enabling the calculation of savings between systems.

Case studies, energy calculation tools that show payback/profit expectation and white papers are available upon request.

Our policy is one of continuous improvement. We reserve the right to alter our dimensions and specifications without notice.

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