

ENABLING CLEAN ENERGY SHIFTS WITH HYDROGEN BOILERS

Challenge

Natural gas boilers are a core aspect of the HVAC ecosystem, with nearly half of all homes in the U.S. utilizing a natural gas system.

In most systems, heat transfer is done via a hydronic system which transfers heat to radiator panels throughout the building. A key variable in this system is water pressure, as high pressures risk damage or leaks and low pressures create a risk of damage to the heat exchanger.

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Some countries have already enacted legislation setting a potential sunset timeline for the sale of gas-fired systems, based on the assumption that the larger hydrogen ecosystem will be ready.

The major benefit to the use of hydrogen in home and commercial heating applications is the elimination of complete lack of greenhouse gas emissions.

At the core level, hydrogen boilers take two parts hydrogen (H₂) and combine them with one part oxygen (O₂) – burning them to generate both heat and 2 units of water (H₂O), which can be bled out of the system through a condensate pipe.

While it is highly flammable, hydrogen can also be safely stored, and has a higher potential energy than other fuels. One kg of hydrogen contains approximately 33.3 kWh of energy, while gasoline holds approximately 12 kWh/kg.

Solution

Sensata's solutions for hydrogen-fired boilers are essentially very similar to those in place for traditional natural gas-fired boilers, with pressure sensors deployed to monitor safe levels of pressure within the system, and thermostats to manage temperature within the boiler.

There are also a number of other considerations for engineers to evaluate when looking at hydrogen boilers. Sensata's products provide safety through reliable data readings in even the most challenging environments related to condensation, heat, water ingress, and more.

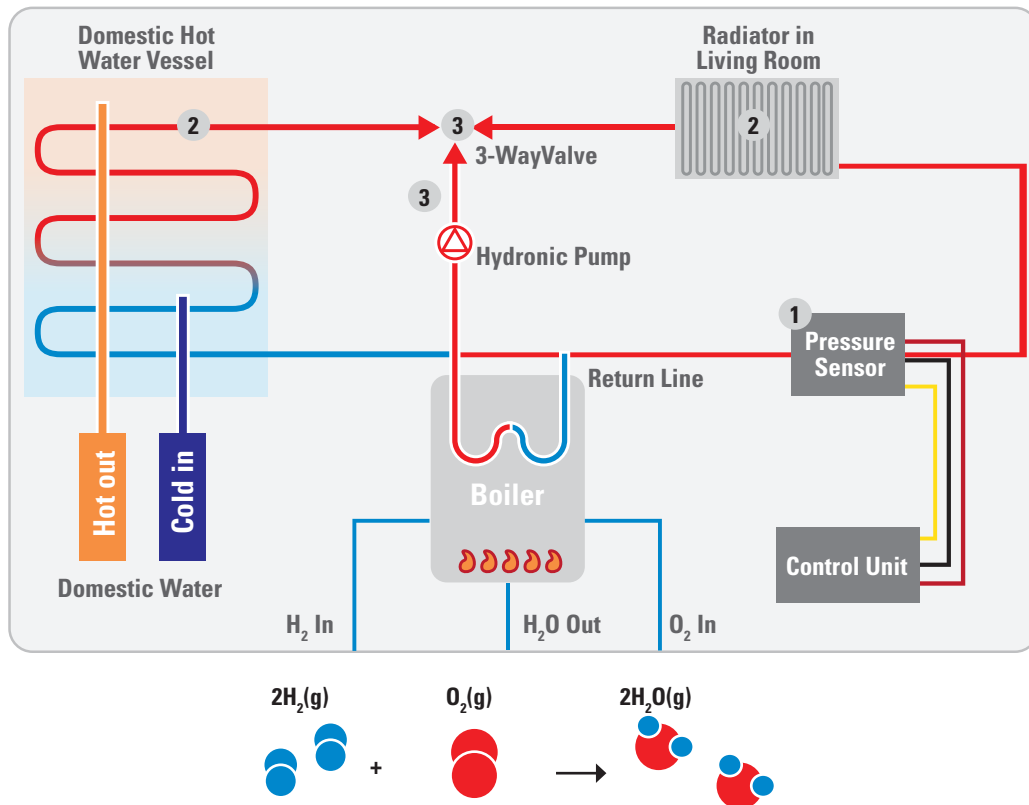
How widespread hydrogen-fired systems become will largely be a function of how efficiently hydrogen gas can be created, stored, and delivered to buildings worldwide as technology improves.

Hydrogen is often created using fossil fuels, which counteracts any perceived environmental benefit despite the lack of greenhouse gases at the end use location.



RECOMMENDED PRODUCTS

Reference on Diagram	Product	Features	Function
1	116CP Pressure Sensor	<ul style="list-style-type: none"> Accurate and reliable pressure measurement, offered in a compact plastic package REACH/RoHS compliant; 0-4 to 0-16 bar The sensor is designed for measuring pressure of liquid media 	Monitoring of the safe levels of hot water pressure
2	3NT Thermostats	<ul style="list-style-type: none"> Due to the innovative dry seal design, the 3NT is ideal in systems where moisture build up is common -40°C to 240°C temperature rating, multiple switch actions available, ISO9001: 2000 certification 	Disconnection of the circuit in case of overtemperature
3	EL Series Solid State Relays	<ul style="list-style-type: none"> 21mm wide package 10A & 30A @ 24 to 280 VAC UL & cUL Recognized, CE & RoHS Compliant, TUV certified 	Offers the end-user silent operation of blowers or fans on the thermal units.



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