

## The energy of the future

# Hydrogen-compatible composite system for condensing boilers

**As a clean energy supply, hydrogen could revolutionize the heating technology sector. The first experiments are already on the market and ebm-papst is also prepared for gas condensing boilers featuring climate-neutral fuel with its NRV 118 Hydrogen composite system.**

### Technical requirements

Many manufacturers are working on converting their condensing units to clean energy supply with as few technical changes as possible. Hydrogen is the chemical element with the lowest density, which is why components in condensing boilers have to be adapted. The combustion behavior requires special attention. As the flame speed is eight times higher than with methane, the ignition times in the combustion controller have to be checked and adjusted if necessary. Hydrogen has a lower heating value than methane but its Wobbe index, important for the interchangeability of fuel gas, is almost as high. For an optimal mixture in the venturi, the gas/air ratio controls have to be designed correctly. As a result, the interaction between the gas blowers, venturi and gas valve is of great importance.

### NRV 118 ready for H<sub>2</sub>

The established NRV 118 composite system from ebm-papst is already designed for use with a hydrogen content of up to 10% without any changes. Thanks to a few changes, the composite system is even suitable for use with 100% hydrogen. This has now been proven in several investigations and initial field tests. The leak tightness of the gas valve and blower has been increased and the materials used checked for their suitability. Thanks to a special pre-mixing device, the NRV 118 hydrogen is ideally suited for hydrogen use. The "premix" gas blower compensates for the disadvantage of the lower Wobbe index and calorific value of hydrogen, while at the same time increasing burner pressure loss due to the gas/air mixture upstream of the fan. Complex control cables, as for operation in excess pressure, are not required. Furthermore, higher modulations can be run because the gas valve can be optimally controlled by negative pressure.

It will be some time before the clean fuel can be used extensively for heating, but if developments continue in science, politics and industry, this could become reality in the not-too-distant future.

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March 9, 2020 - Page 1 of 2

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Image 1: The "NRV 118 Hydrogen" composite system is ideally suited for hydrogen use.

Image: ebm-papst  
Characters: approx. 2,400, including headings and sub-headings  
Tags: Hydrogen, condensing boiler, composite system, NRV 118, gas blower, venturi, gas valve, calorific value  
Link: <https://www.ebmpapst.com>

### About ebm-papst

The ebm-papst Group, a family-run company headquartered in Mulfingen, Germany, is the world's leading manufacturer of fans and motors. Since the technology company was founded in 1963, it has continuously set the global industry standard. With over 20,000 products in its range, ebm-papst provides the best energy-efficient, intelligent solution for virtually every ventilation or drive engineering task.

In fiscal year 2018/19, industry leader ebm-papst generated revenues of 2.18 billion euros. It employs over 15,000 people at 28 production sites (e.g. in Germany, China and the US) and in 48 sales offices worldwide. Fans and motors from the world market leader are used in most industries, including ventilation, air conditioning and refrigeration, household appliances, heating, automotive and drive engineering.

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March 9, 2020 - Page 2 of 2

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