



THE RIGHT QUANTITY

OF ENERGY

FOR EVERY

CUBIC METER OF GAS

DATA SHEET



» EMMA

The **EMMA** system fulfills the widespread need to reduce gas consumption in the gas preheating process.

With **EMMA**, Regas changes the rules, because it switches the pre-heating process from a consuming into a productive process.

With **EMMA**, the pre-heating system changes from an on/off process and switches to continuous, real-time control. This control is not only based on gas temperature, but also on flow rate, pressure drop, water temperature, and seasonal weather.



» CONTROL

EMMA's basic principle is to continuously provide the right heat amount to natural gas. Every cubic meter only needs the amount of energy sufficient to reach the set temperature. Possible over-heating is useless and inefficient and must be avoided.

There are two essential requirements:

1. Knowing the instantaneous temperature.
2. Controlling the heat amount transferred from water to gas at the same time (temperature and water flow-rate value).

The energy amount that needs to be transferred in the time unit depends on different factors:

- Inlet and outlet gas pressure (instantaneous enthalpy drop)

- Inlet gas temperature
- Outside air temperature
- Gas flow rate
- Heat exchangers' efficiency
- Temperature loss along pipes
- System's thermal inertia

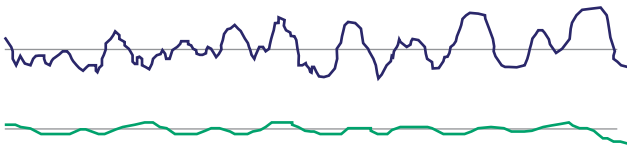
The **EMMA** system has a unique, predictive algorithm which, through its auto-learning feature, is able – just a few hours after commissioning – to automatically keep pace with station behaviour and correctly bring the gas temperature to the requested set-point in the range of $\pm 1^{\circ}\text{C}$, than the set temperature.

» SAFETY

The pre-heating phase in city-gates and other stations is usually the kind of service which cannot be stopped and must keep working even in case of electricity cut-off.

Therefore, one of **EMMA**'s main features is to maintain and improve service continuity.

The passive management of the system keeps working while **EMMA** smartly controls the temperature in the range of existing gas thermostats.



Any possible deviation from the settings, due to a power cut-off or transducer's failure, is detected from the gas thermostats, which take over the **EMMA** system, keeping the station running safely.

Apart from keeping the usual safety features of a station unaltered, **EMMA** is capable of providing working details of all the equipment involved in the process, by optimizing its working conditions and prevent irregular system behavior.

» LEGEND

- Gas temperature **without EMMA**
- Gas temperature set point
- Gas temperature **with EMMA**

» STANDALONE AND REMOTE CONTROL

The **EMMA** system has a graphic interface embedded in its management software, which allows setting and controlling field equipment in different ways:

» WINTER

- Boilers and water pumps are enabled
- Winter temperature and other optimization features are enabled

» SUMMER

- Automatic and full off-switching of the system are enabled
- Special anti-dewing function and other special working options can be enabled

» USER

- The system can always be user-defined, as well as its working time

Control can be

» LOCAL

- via serial interface and CCR proprietary control software
- from a keyboard and display (option)

» REMOTE

- from CCR proprietary software (option)
- from third parties' SCADA, since the system is based on Modbus RTU protocol and can be adapted to other standard industrial protocols (option)

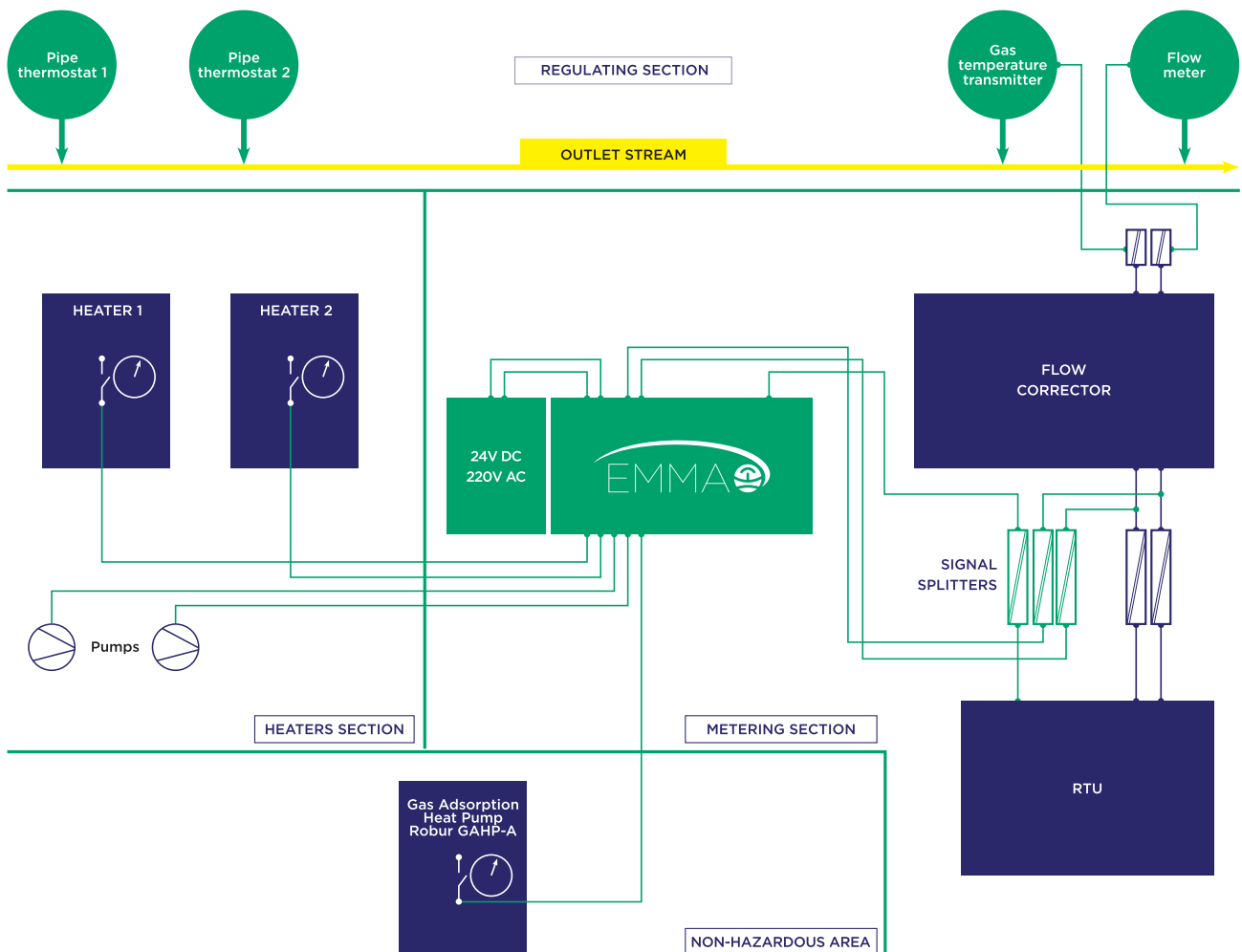
» MAIN FEATURES

» MAIN COMPONENTS:

- Power supply: 230V AC 50/60 Hz or 24V DC
- Modular controller
- DIN board for the connection of IN and OUT signals
- RS232 serial communication port (option)
- GSM/GPRS/3G modem (option)
- 3.6" FSTN display with 240x80 pixel resolution 10 freely configurable function keys

» AVAILABLE CONNECTIONS (DIN board):

- 4 analogue inputs 4÷20 mA (configurable as active or passive)
- 8 digital inputs (configurable as active or passive)
- 6 transistor digital outputs
- 1 RS232 serial connector
- 1 RJ45 Ethernet connector



» EMMA ECO

BASIC

Stand-alone version. The system is locally configured through a dedicated software interface. It does not allow remote control.

OPEN

Remote-control version. Through a network interface, the system shows the user all setup parameters, status check and traces' record, such as water and gas temperature and station flow rate. Centralising decisions and interrogating the system remotely, without any need to move, allows considerable savings in terms of time and staff, as well as effective safety benefits.

EVENTS

- With specific user's settings, all read status can generate warning and alarm events. This information is forwarded to the remote control software (CCR - proprietary REGAS software - or compatible third-party SCADA) for recording and management.

DATA

- Values coming from the process are continuously recorded and can be analyzed by the software, even in off-line mode.

INPUTS

- The system allows remote input commands, especially for diagnostics.

» EMMA PREMIUM

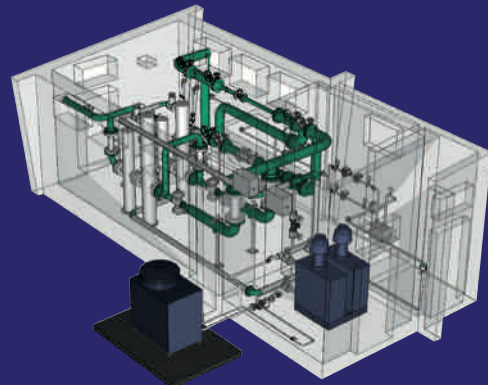
The high efficiency offered by **EMMA ECO** can be even increased by using renewable energy sources. Regas has succeeded combining new technology and traditional systems - a gas adsorption heat pump (GAHP) with notable performance.

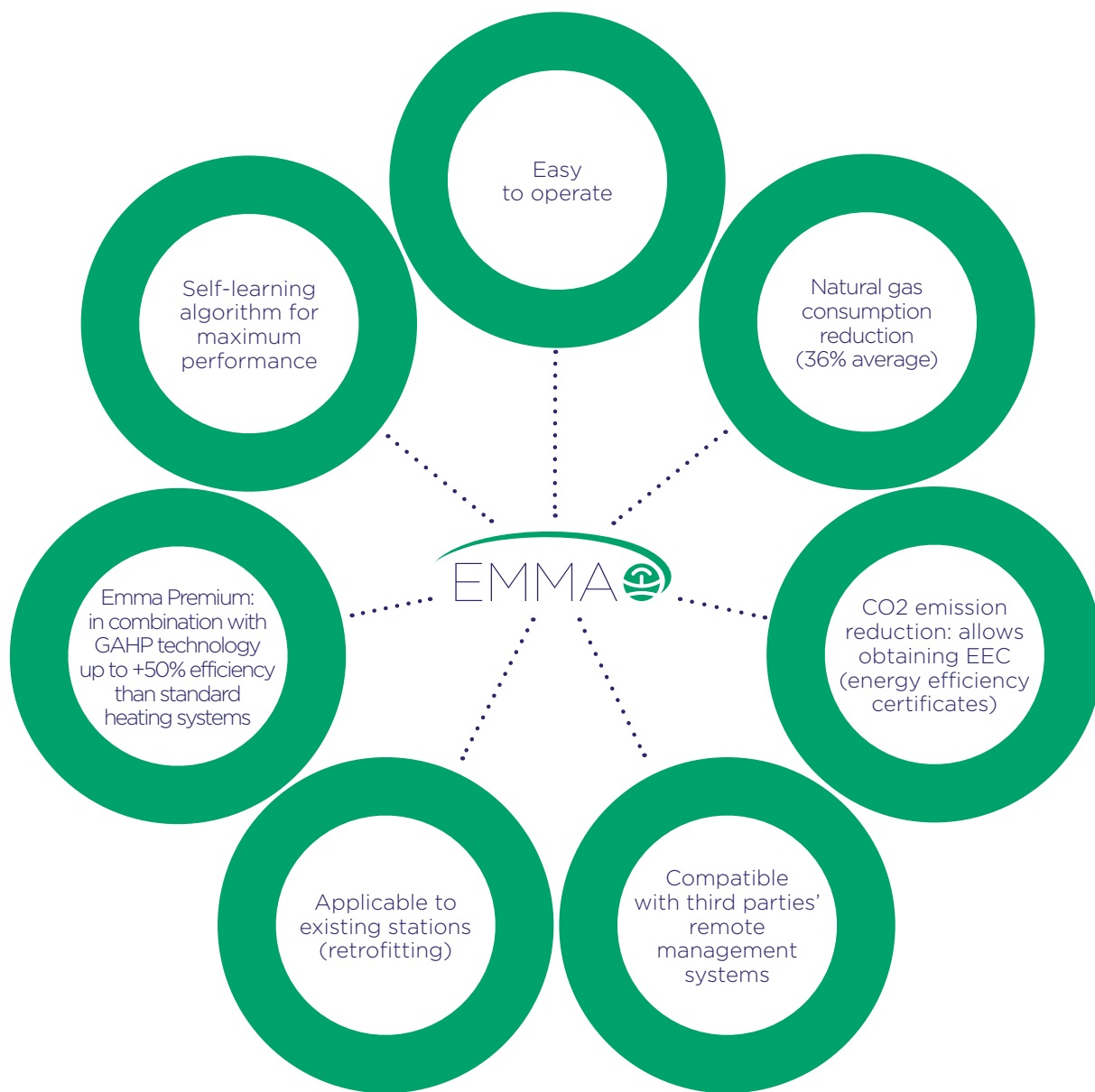
Through a less invasive installation which keeps the affordability and safety of the existing water circuit unaltered, **EMMA PREMIUM** reaches never-seen-before efficiency performance in terms of gas consumption and respect of the environment.

GAHP is installed in parallel to the existing boilers and inlet- and outlet- water pipes are derived from the existing ones.

» **TURNKEY: REGAS'** high specialization allows supplying **EMMA PREMIUM** as a turnkey formula.

» **EMMA PREMIUM:** a perfect example of integration between renewable energy and technology for the gas industry, in compliance with the objectives of emission reduction requested by international governing bodies.





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