The Selective Catalytic Reduction system (SCR) is presently the most effective technology available for reducing nitrogen oxides, known as NOx, from the emissions of combustion engines. Based on this technology, Bersy has developed a modular BYNOX SYSTEM, which is easily and rapidly integrated in the existing system and is also easy to service. It is suitable for installation on all sizes of engines that run on: NATURAL GAS, BIOGAS, SYNGAS, DIESEL, BIODIESEL AND VEGETABLE OIL-BASED FUELS.

The BYNOX SYSTEM reduces NOx emissions by injecting a urea solution directly into the flow of exhaust gases. A specifically designed mixer nebulises the urea solution. Subsequent reactions within the SCR catalyst, which occur at a temperature of between 300 and 500 °C, enable the following chemical activities:

\[
\begin{align*}
\text{N}_2\text{H}_4\text{CO} + \text{H}_2\text{O} & = 2\text{NH}_3 + \text{CO}_2 \quad \text{(Decomposition of the urea)} \\
4\text{NO} + \text{O}_2 + 4\text{NH}_3 & = 4\text{N}_2 + 6\text{H}_2\text{O} \\
6\text{NO}_2 + 8\text{NH}_3 & = 7\text{N}_2 + 12\text{H}_2\text{O} \\
\text{NO} + \text{NO}_2 + 2\text{NH}_3 & = 2\text{N}_2 + 3\text{H}_2\text{O}
\end{align*}
\]

The basic components of the BYNOX SYSTEM required for the afore-mentioned reactions are the batching module and the SCR catalyst.
The **BYNOX** SYSTEM is easy and quick to install in the exhaust line thanks to the modular components pre-arranged for such an application.

These components are: mixer with Urea injector, **SCR** catalyst, oxidation catalyst and **NOx** & temperature sensors. The remaining components of the batching module, such as the urea tank, control unit/pump, compressor and exhaust gas analyser, are compact and are arranged within the available compartments of the system.

They are quickly connected, both electrically and pneumatically, thanks to the piping and the pre-arrangements supplied.

Ignition and system tuning must be set using special software.

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**ASSEMBLY**

**Gas analyser**

**Application**

**Urea tank**

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**MAINTENANCE**

Routine maintenance of the **BYNOX** SYSTEM merely entails topping-up of the urea solution in the tank whenever the dedicated indicator lights up on the display of the system’s control unit.

The same display shows the operating data and points out any system anomalies or alarms possibly detected.

Additional maintenance may only be necessary if such indications appear.

If the optional exhaust gas analyser module is installed, it will require annual maintenance.

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**OPTIONAL ACCESSORIES**

**Bersy** offers optional accessories to satisfy all application requirements, namely:

- oxidation catalyst module for reducing the level of CO and HC
- compressor module to supply the air required for injection
- heating module to keep the urea solution in liquid form in water, even in cold weather
- exhaust gas analyser module
- sampling module of the pollutants emitted
- uprated urea tank
- exhaust line insulation
- customised piping
- installation