

BANARG® Control

This all-in solution consists of two independent wireless ethylene sensors. These sensors send data to the BANARG® Control measurement kit, which is directly connected to a gas bundle containing the BANARG mixture. If the ethylene concentration in the greenhouse drops below a certain preset level, the measurement kit opens the gas valve, closing it again once the target concentration has been reached.

The system comes with a seven-inch touchscreen display to show the ethylene concentration levels and gas feed. The sensors are positioned in greenhouses among the tomato plants, where they measure ethylene concentrations down to ppm levels (0–10 ppm). They wirelessly transmit the ethylene concentration data over a distance of up to 150 meters to the measurement kit. Two independent control loops allow gas levels to be monitored and controlled at two different greenhouses at the same time.

The entire system is designed for ease of installation and maintenance. It also comes with a timer so the operator can program start and stop times, plus a data logging function (up to 100 million datasets can be stored on an external SD card for traceability).

Benefits

- Fast, easy installation
- Low maintenance with sensors easily replaced
- Ease of operation with touchscreen display and timer
- Ability to manage two greenhouses simultaneously
 - regardless of size
- Traceability for the greenhouse operator

Getting ahead through innovation

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages, and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardised as well as customised solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimisation, and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – ideas become solutions.

Linde Aktiengesellschaft

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Making our world more productive



Putting the perfect finish on tomatoes

With BANARG® Control



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BANARG® Control system with portable control unit and wireless sensor.

In today's market, tomatoes are held to incredibly high aesthetic standards. Only the best-looking produce makes it on to supermarket shelves. If tomatoes don't ripen at the right time, they cannot be sold – which creates waste and unnecessary expense for producers. In short, tomato producers have to make sure their produce is in perfect condition at exactly the right time.

This can be a challenge, especially in colder climates towards the end of the growing season when days grow shorter and the sun loses its intensity. Under these conditions, ripening takes longer, and at some point, will stop altogether. Using chemicals such as ethephon to ripen tomatoes in greenhouses is either banned or rejected by consumers as they can leave residue on the produce. Natural ripening processes require extra heating and lighting at the end of the season, which can be very costly. Linde has developed a solution that supports greenhouse ripening without the use of chemicals, enabling producers to make the most out of their last harvests.



Natural ripening process of tomatoes in greenhouses.

What is BANARG®?

BANARG® Control is a mobile dosing solution designed to be used in greenhouses to ripen tomatoes before they are harvested. It can be installed in all types of greenhouses used to grow tomatoes. This easy-to-use system feeds a bespoke, safe BANARG gas mixture into greenhouses, allowing it to be carefully controlled and targeted to certain areas to ensure that produce ripens exactly when it is needed.

Safe, versatile gas

The BANARG gas mixture comprises 96 percent nitrogen and 4 percent ethylene. Ethylene is a plant hormone that stimulates plant growth and ripening. It is classified as a plant protection product and must therefore be authorised for use in Europe in line with European Regulation 1107/2009. Linde's BANARG solution has been approved for ripening tomatoes in Switzerland and Belgium.