**FertiDozer**
The FertiDozer is a non-controlled fertigation machine. It consists of:
- Two Fertilizer Pumps: one of 1200 L/H and the other (for acid) of 160 L/H.
- Pressure: up to 4 bars. (Higher pressure models are available via special order)
- Main Line Pressure: up to 4 bars.
- All the models can be equipped with up to 8 electric fertilizer pumps (120 L/H).

**Shahak**
The Shahak like the FertiGal, is a direct injection in-line fertigation machine. It differs from the other machines by its direct injection Electric Fertilizer Pumps instead of the venturi pumps and a booster. The electric pumps simply start and stop frequently according to the controller commands.

**FertiGal**
The FertiGal is a direct injection in-line fertigation machine. The main tubing with its Main Valve, Water Meter, Filter etc. are not included in the FertiGal.

**FertiJet**
The FertiJet is a direct injection by-pass fertigation machine. The main tubing with its Main Valve, Water Meter, Filter etc. are not included in this FertiJet.

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Galcon’s unique Fertigation Machines are devices for mixing fertilizer in the irrigation water. The fertilizer is injected to the pressurized water system via venturi pumps. Up to 8 channels of fertilizer injection can be employed together.
**Background**

The Green House cultivation applies hydroponics irrigation whereby plants grow in a substrate (pH 6.5 to 6.8) and the nutrient is mixed with the water. The nutrient ratio must remain constant to achieve a balanced growth. In addition, the water temperature, EC (Electric Conductivity), and pH are critical factors in maintaining a healthy plant.

**Types of machine**

There are five types of machines:

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1. Electric Table: 350 liter tanks
2. Control Table: 250 liter tanks
3. Fertilizer Table: 100 liter tanks
4. A Pressure Sustaining Valve to prevent cavitation in the Electric Pump
5. A Level Sensor for automation and information

**The Component**

**The Control System**

A system that includes a sampling cell with two electrodes EC and pH that are connected to an electronic monitor. The monitor converts the electrodes signal to a standard 4-20 mA signal ready to the Galileo Controller.

**Fertilization Programs**

The fertilizer programs are defined in the Galileo. Each of the programs contains: amount or proportion of the fertilizer for every irrigation time, up to 5 start times in a day, Cyclic operation with intervals from 1 Sec. to 24 hours and many more options.

**The Irrigation Programs**

Up to 200 Irrigation Programs can be setup in the Galileo each containing up to 50 irrigation valves, irrigation according to Time or Volume, the required preset Fertigation program, up to 5 start times in a day. Cyclic operation with intervals from 1 Sec. to 24 hours and many more options.

**The Drainage Programs**

Installing the national drainage sampling system (GAGN) enables measurement of the amount, EC and pH of the draining water by the Galileo for information and automatic correction of the next irrigation.

**For additional information about Galileo models and their performances see the Galileo Controllers data sheet.**

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**The FertiMix Machine**

![FertiMix Machine Image](https://via.placeholder.com/150)

**The FertiMix System**

- **Electric Table:** PVC non corrosive piping installation.
- **Electric Table:** PC computer connected to the Controller via direct line, cellular or radio.
- **Electric Table:** In addition the controller is connected to the field's valves, the green house’s monitoring, data acquisition and more. The features concerning fertigation are:
  - Volume, the required preset Fertigation program, up to 5 start times in a day, Cyclic operation with intervals from 1 Sec. to 24 hours
  - Up to 200 Irrigation Program can be setup in the Galileo each containing: up to 50 irrigation valves, irrigation according to Time or Volume

**The FertiMix Components**

- **Electric Pumps:** up to 4.5 Bars.
- **Electric Pumps:** up to 60 cubic meters per hour.
- **Venturi Pumps:** up to 35 cubic meters per hour – to prevent operation in the Electric pump in “No Water” conditions.
- **Venturi Pumps:** up to 25 cubic meters per hour – to prevent cavity in the Electric Pump.
- **Venturi Pumps:** up to 9 Cubic meters per hour – to prevent boiling in the case of low flow rate.

**The FertiMix Key Features**

- **Installation:** on the entrance of the Venturi body it can be either fully open or closed.
- **Installation:** a “T” shape body with a unique nozzle inside.
- **Installation:** A transparent conic tube with a ball inside. The ball rises according to the momentary suction, pressure for the irrigation and mixing power.
- **Installation:** A Pressure Sustaining Valve

**The FertiMix Features**

- **Operation:** The monitor also serves for calibration of the electrode enabling the constant and clear presentation of the readings during operation.
- **Operation:** The monitor converts the electrodes signal to a standard 4-20 mA signal ready to the Galileo Controller.
- **Operation:** The fertilizer programs are defined in the Galileo. Each of the programs contains: amount or proportion of the fertilizer for every irrigation time, up to 5 start times in a day, Cyclic operation with intervals from 1 Sec. to 24 hours.
- **Operation:** Many other parameters concerning the behavior of the machine are easily defined.
- **Operation:** The type of fertilizer is defined for each fertilizer pump.
- **Operation:** The type of the pump such as Electronic, Electric, Venturi or by-pulse.
- **Operation:** The type of the pump such as Electronic, Electric, Venturi or by-pulse.
- **Operation:** Inlet Pressure:
  - Electric Pump: up to 4.5 Bars.
  - Electric Pump: up to 60 cubic meters per hour.
  - Electric Pump: up to 4.5 Bars.
  - Electric Pump: up to 60 cubic meters per hour.
- **Operation:** Outlet Pressure:
  - Electric Pump: up to 60 cubic meters per hour.
  - Electric Pump: up to 4.5 Bars.
  - Electric Pump: up to 60 cubic meters per hour.
- **Operation:** Water Temperature Sensor:
  - to prevent the water boiling in the case of low flow rate.
- **Operation:** A Level Sensor for automation and information
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**The Galileo Controller**

The Galileo controller, Galcon Ag’s main line of products, controls both the irrigation system and the fertigation machine together thus synchronizing their operation and providing a great deal of operation flexibility.

**Hardware**

- **Connections:**
  - The Galileo hardware includes Outputs, Inputs and Analogs that are connected (in the factory) to all of the machine’s elements.
  - In addition the controller is connected to the field’s values, the green house’s elements and other components for full control of the system.

- **Operation:**
  - The control program can be accessed directly from the keyboard or via an external PC computer connected to the Controller via direct line, cellular or radio.

- **Software:**
  - The Galileo software is a user friendly easily accessed program for programming monitoring, data acquisition and more. The features concerning fertigation are: Definitions:
  - The fertigation components are defined in the Galileo.
  - The type of fertilizer is defined for each fertilizer pump.
  - The type of the pump such as Electric, Electronic, Venturi or by-pulse.
  - Many other parameters concerning the behavior of the machine are easily defined.

- **The Fertigation Programs**
  - Up to 30 different fertilizer programs can be setup in the Galileo.
  - Each of the programs contains: amount or proportion of the fertilizer for every irrigation time, up to 5 start times in a day, Cyclic operation with intervals from 1 Sec. to 24 hours.
  - All the models can be equipped with up to 8 Fertilizer pumps (250 L/H).

- **Additional Components:**
  - Water Meter with an electric pulse connected to the controller.
  - Hydraulic Inlet and Outlet valves.
  - A Float to balance the water level in the tank with the outlet onto the field.
  - A Float type Electric Pump supplying: Fertilizer suction, pressure for the irrigation and mixing power.
  - Water Temperature Sensor: to prevent the water boiling in the case of low flow rate.

"Galileo Controllers data sheet."