DryEcoMate

Horticultural dehydrator, using solar thermal and photovoltaic energy, low cost production, modular and portable

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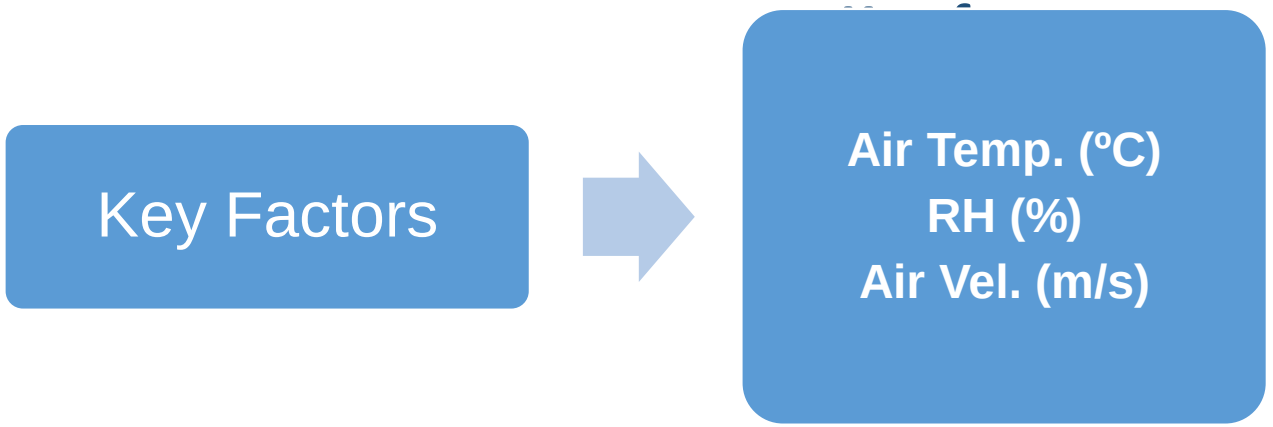
Horticultural dehydration process

Optimization of factors:

- Time
- Product quality
- Energy Efficiency
- Cost
- Flavor/odor



Objetive

To build a dehydrator:

energeticaly efficient

low cost

modular

portable

Using renewable energy

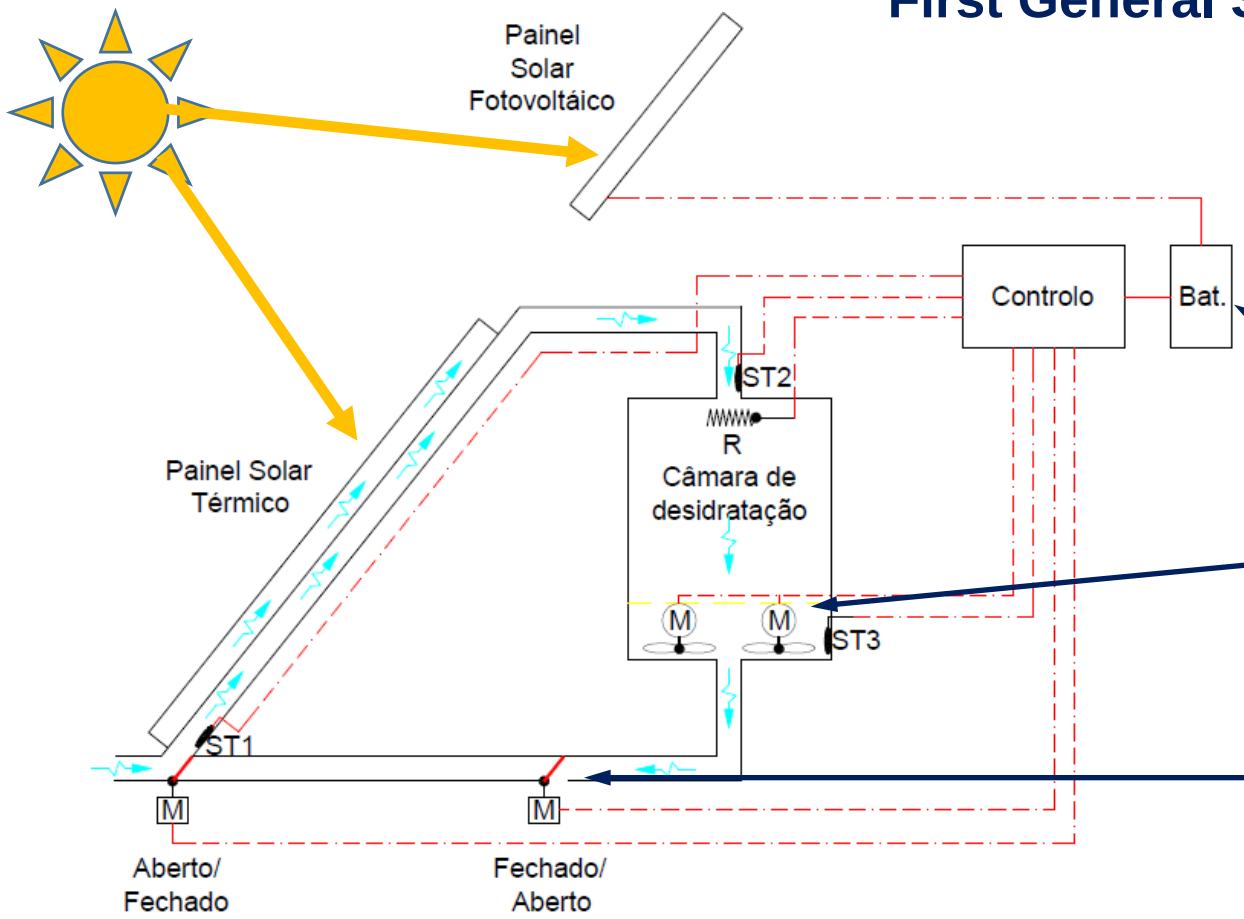
independent operation of weather conditions

To be used by small scale farmers

Developed by

Basic scheme

First General Scheme (Draft)



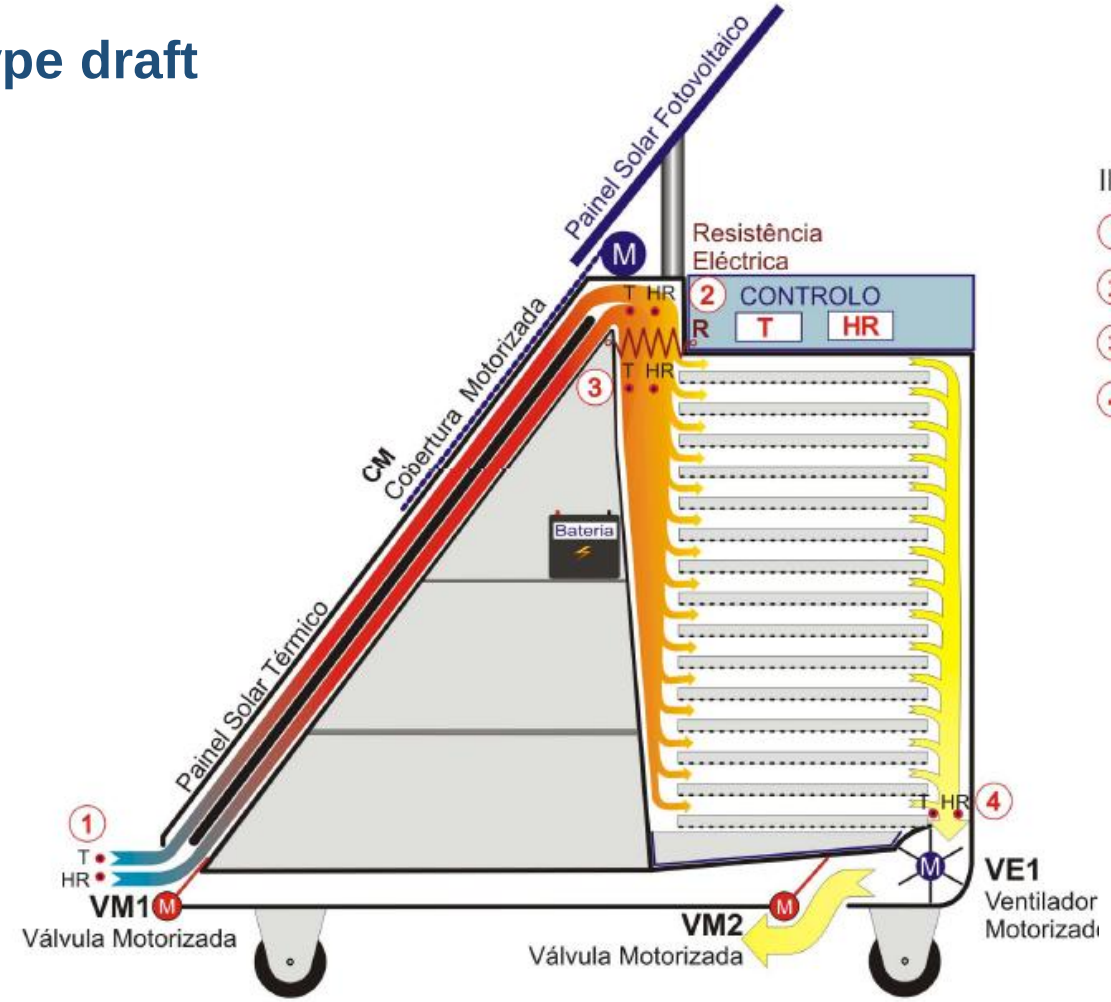
Basic key principles

Accumulation of solar energy (PV panel + batteries)

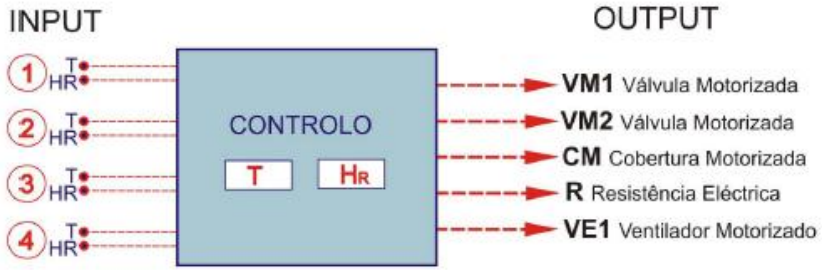
Adaptation of air velocity and air flow rate by the variation of the speed of rotation of the fans

Variation of fresh air and recirculated air mix quantities by the positioning of air motorized valves

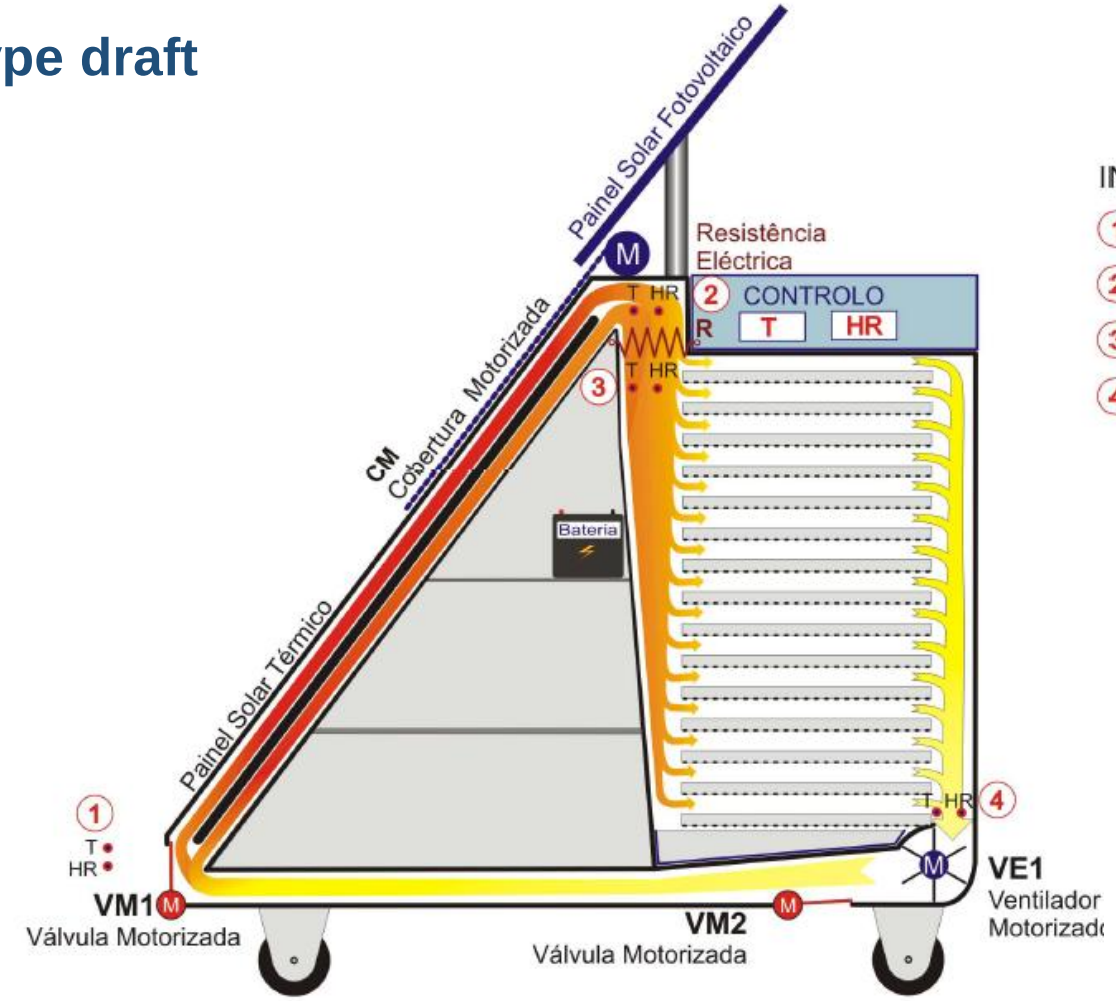
Pre-prototype draft



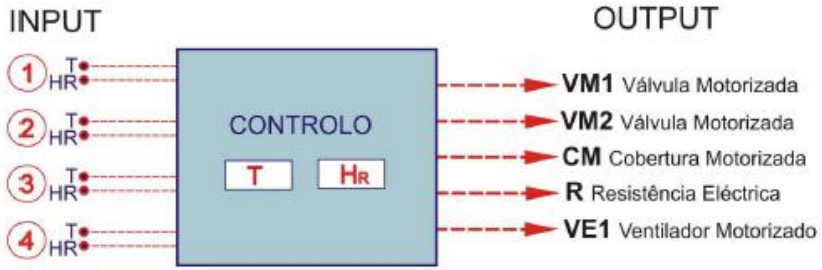
(a) outside fresh air mode



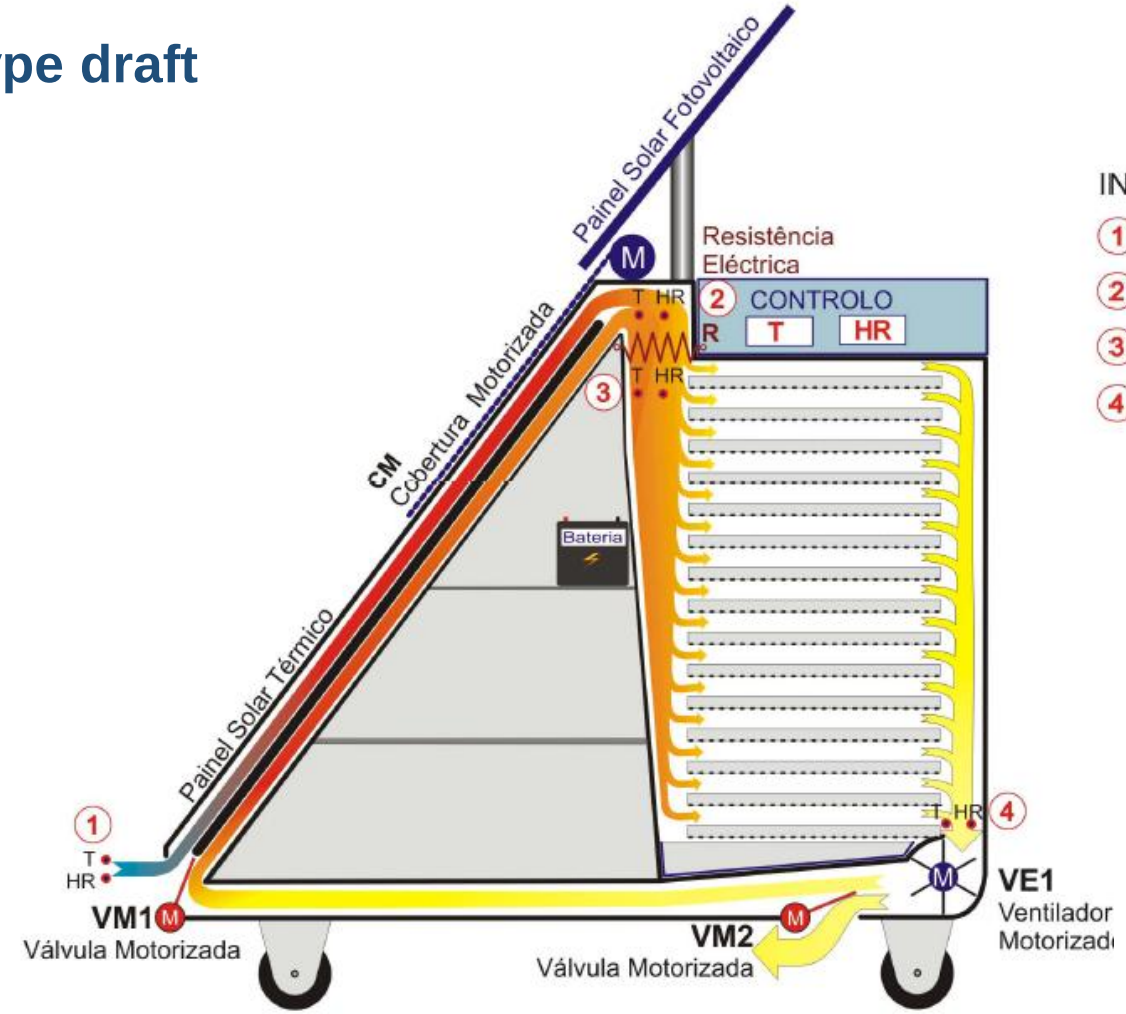
Pre-prototype draft



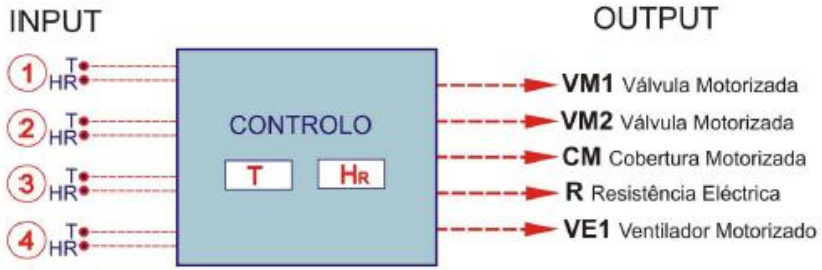
(b) recirculating air mode



Pre-prototype draft

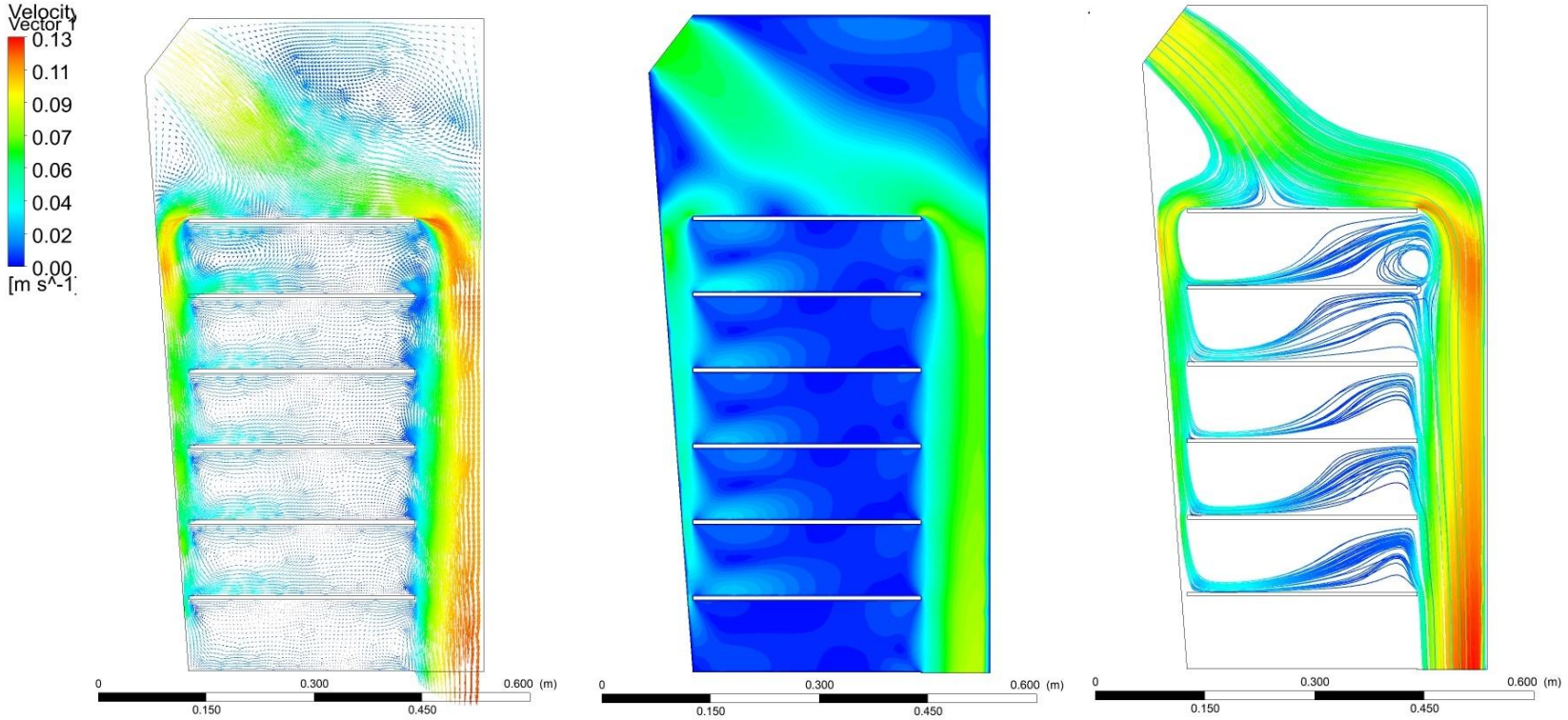


c) mix air mode

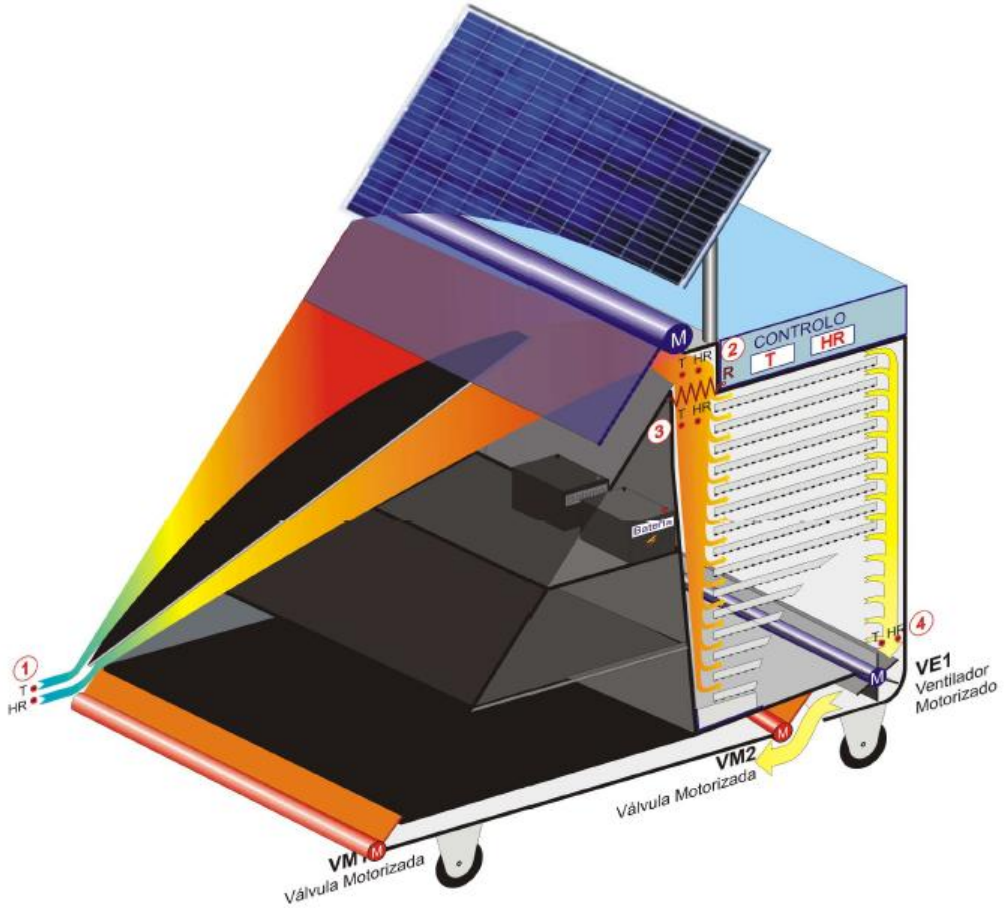


CFD Simulations

velocity vectors, contours and streamlines in the dehydrating chamber



Final Product



Some photos…

Conclusions

Horticultural dehydrator ***DryEcoMate*** developed through a partnership between the Polytechnic Institute of Setúbal, Synege and Regipomo was presented.

DryEcoMate is a low-cost, modular, and portable dehydrator that works with renewable energy, namely solar thermal and photovoltaic and can operate independently of the instant weather conditions.

DryEcoMate allows the optimization of operation by effectively controlling dehydration air temperature and air circulation speed at each time, using the best mixing of recirculated/fresh air flow and variating the air velocity.

DryEcoMate is a lightweight mobile device that allows to be moved and placed in the position that best suits it and allows greater efficiency in operation at all times allowing its placement in the best orientation at each time.

Thank you

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