Alfa’s Know-How

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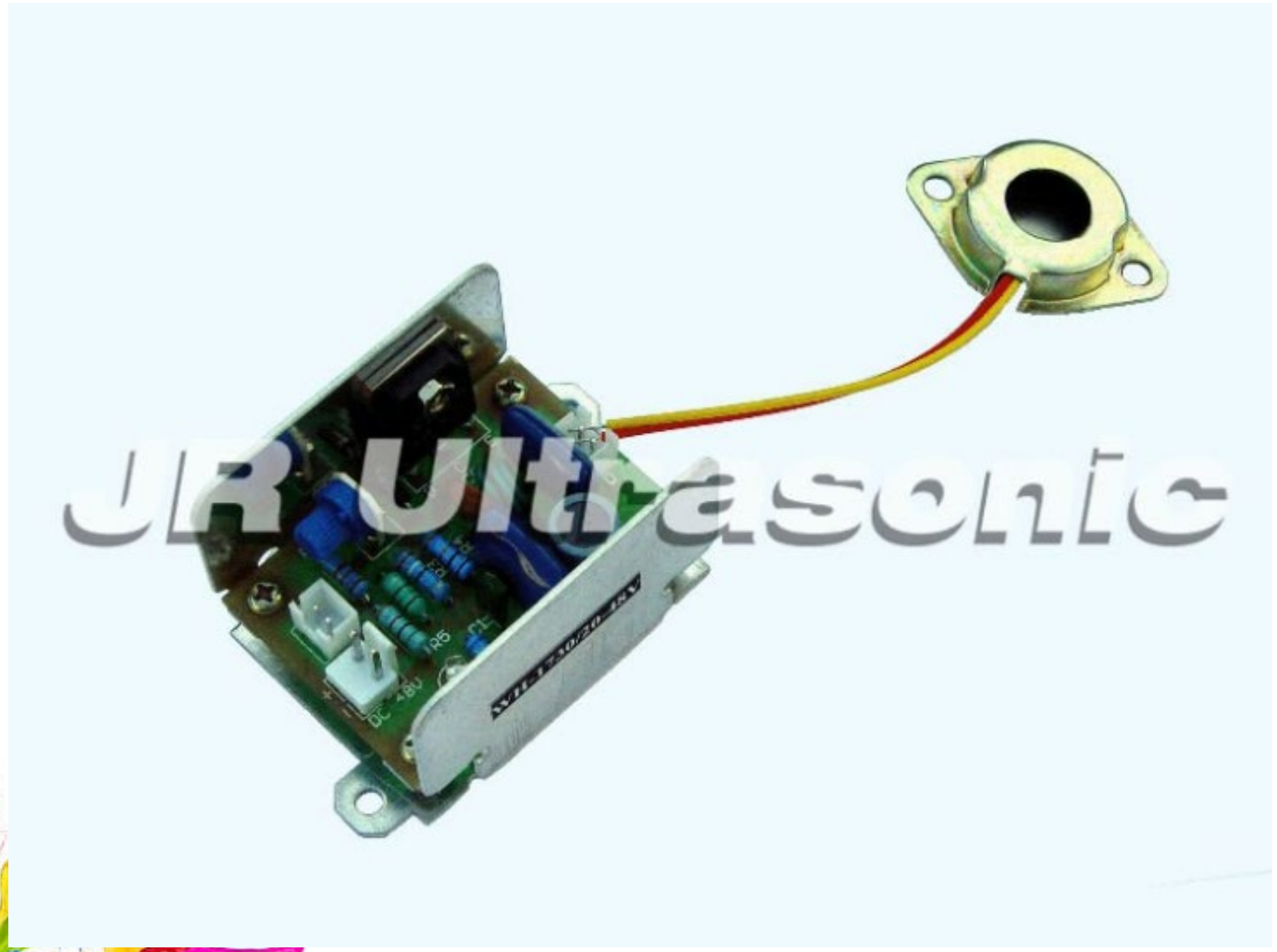
Ultrasonic humidifier



Idea

- Ultrasonic microwave generator to create moisture.
- High efficiency, low water consumption.
- Bacteria free. Macrowave kill bacteria and algae.

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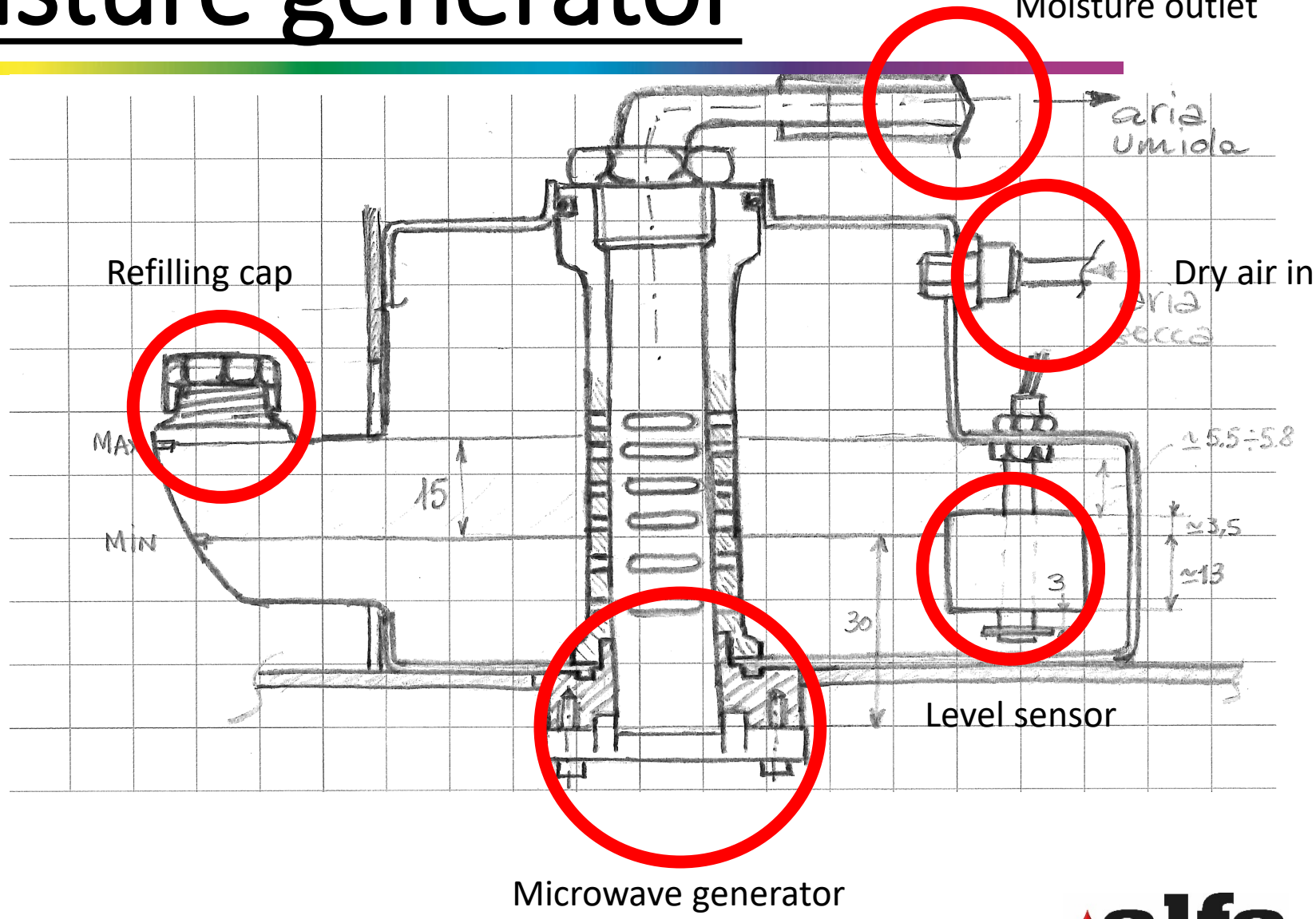
Moisture generator

The system is composed by:

- Microwave generator
- Water level sensor
- Refilling cap
- Dry air inlet
- Moisture outlet



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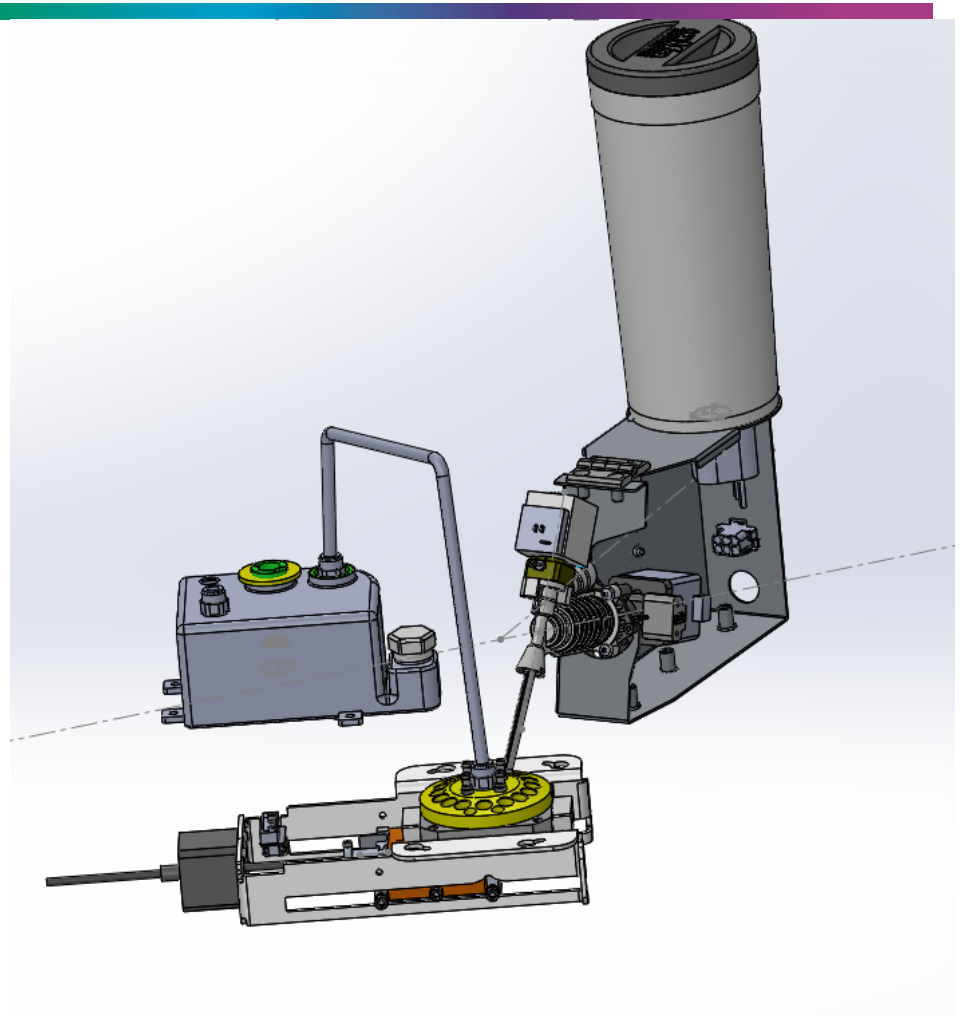
Application Example

Umidifier moistur outlet pipe is connected to the nozzle.

When cap is closed moisture is pumped on duty cycle base to keep high humidity level accordingly with:

- Ambient humidity and temperature.
- Device set up parameters.

When the cap is open moisture is pumped on a continous base. Moisture is lighter than ambient air and keep humidity level high in the open nozzle area. This avoid drying of products not involved in formula dosing.



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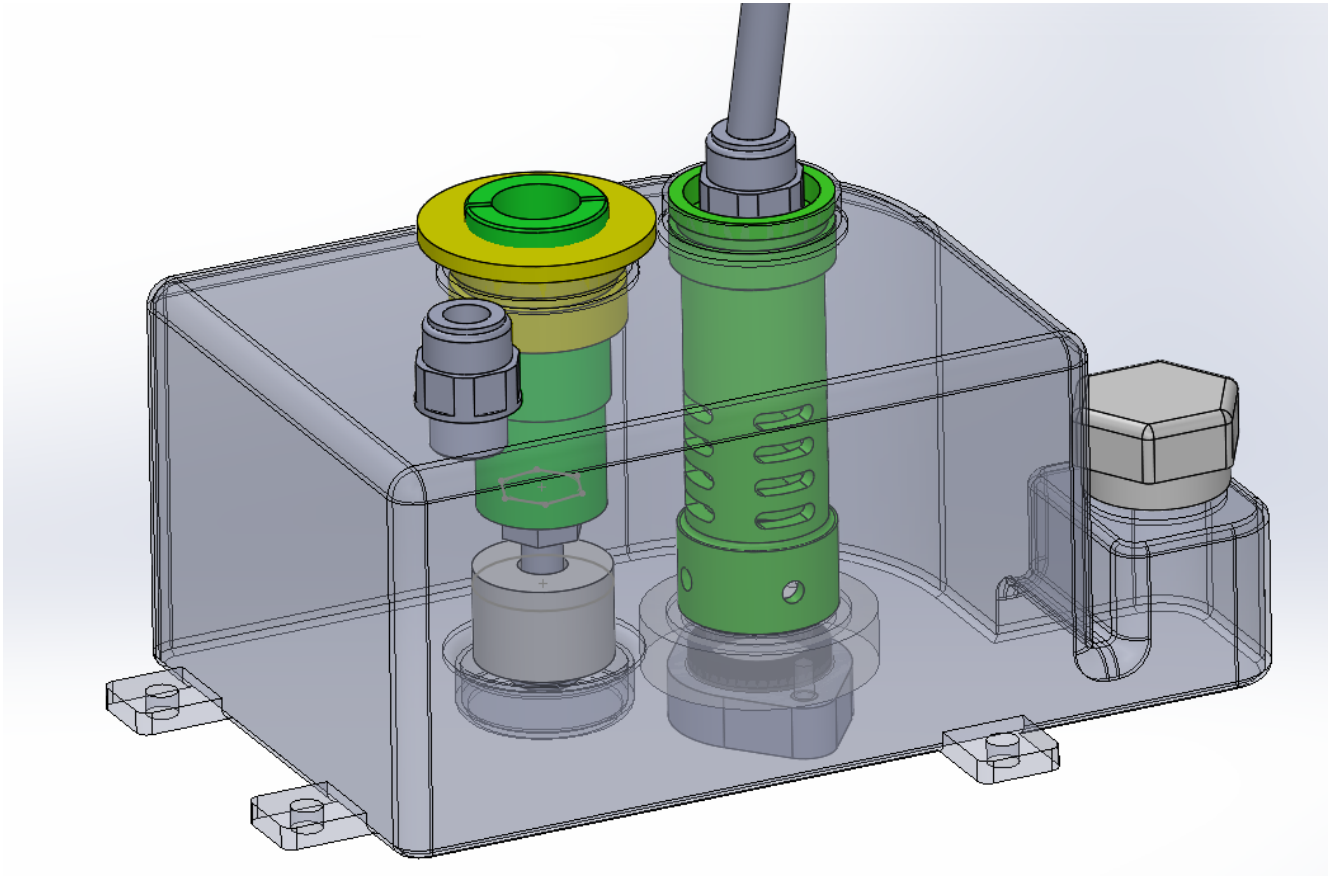
3D Model

The ultrasonic microwave generator is positioned in the bottom part of the bottle

The cilindric device on top of it define an area where the humidity is higher also compared with the rest of the bottle area.

This air is the one in connection with the outlet.



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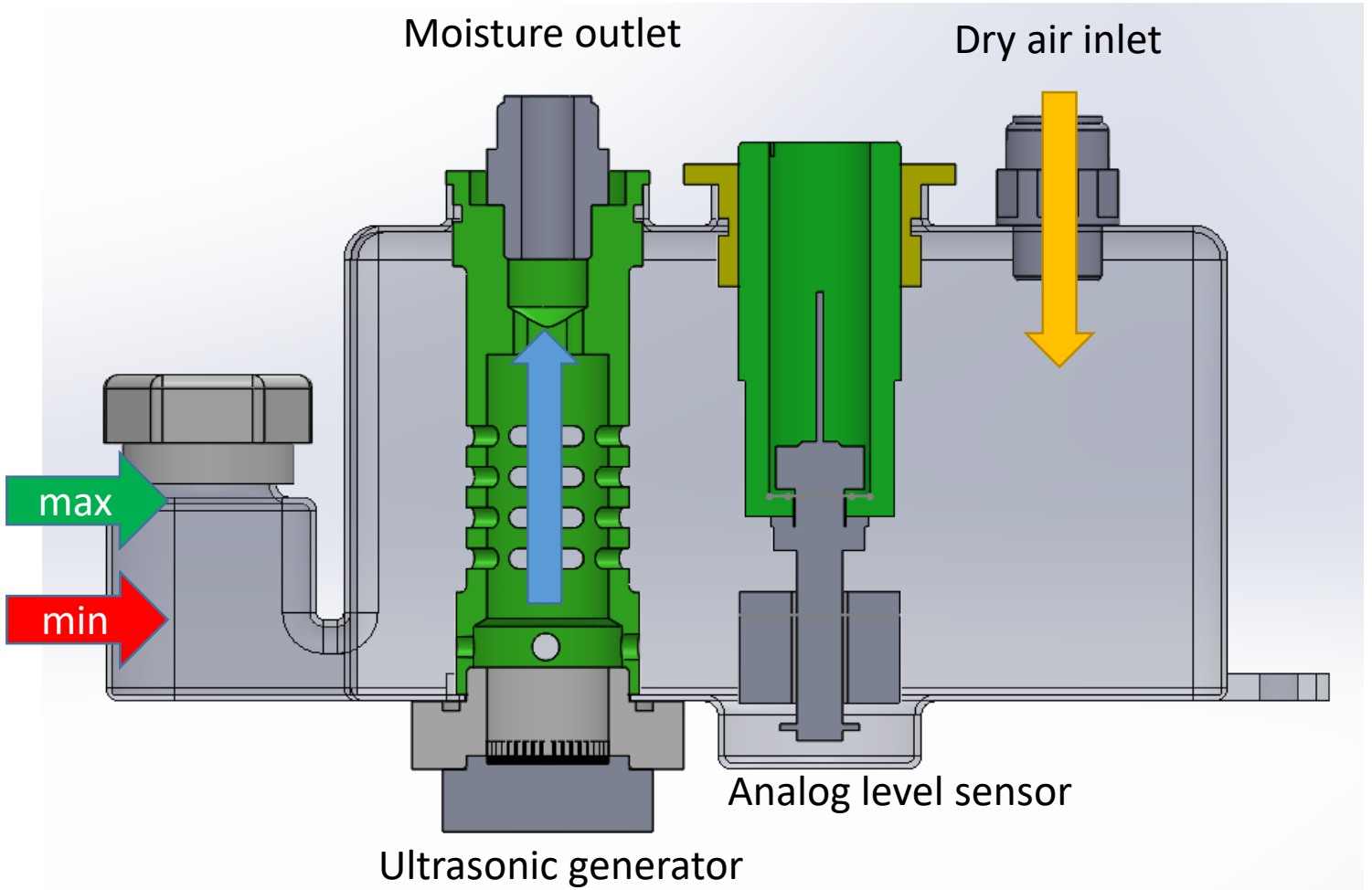
Generazione aria umida

To properly work the ultrasonic generator needs a water level between a pre defined min and max.

Water level is detected via analog sensor. Min level worning will be generated.

Thanks to bottol design it is not possible to overfill the bottle.



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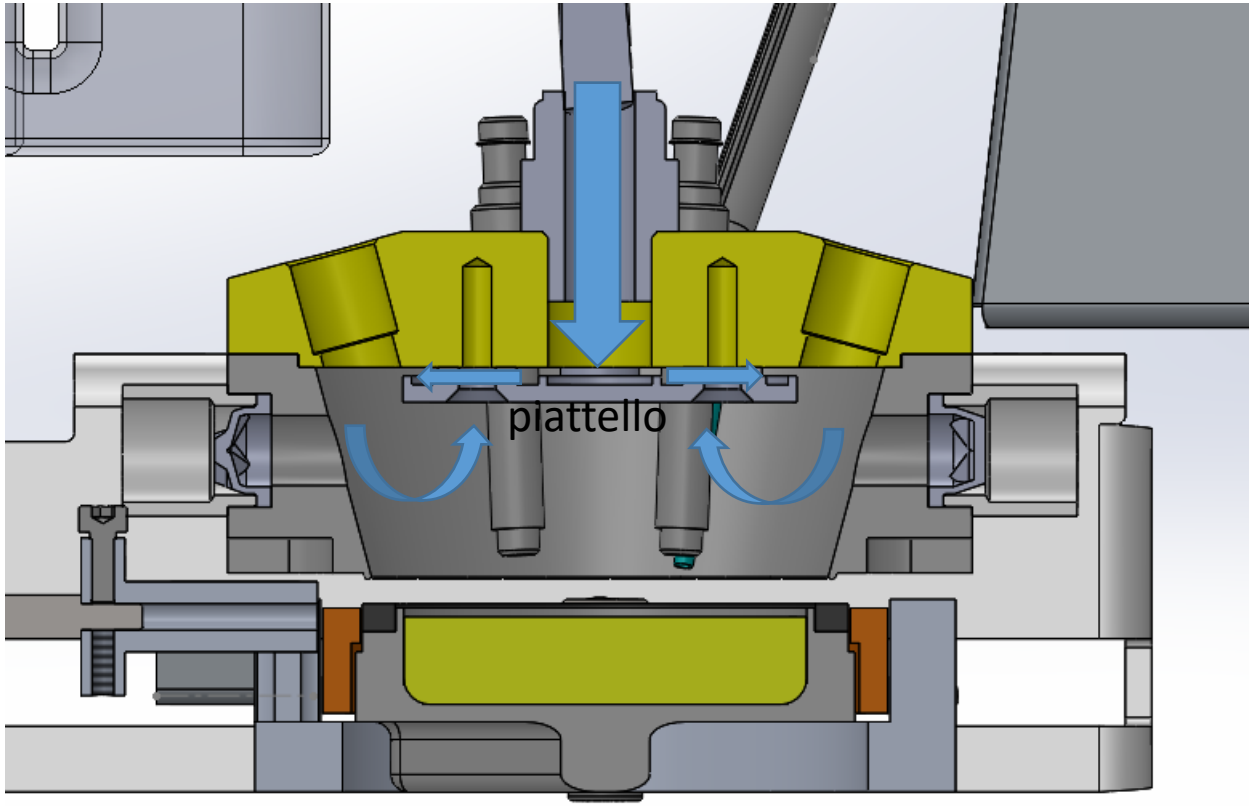
Nozzle

The nozzle section shows a channals system used to armonize moisture diffusion into nozzle area.

This works both with open and close autocap conditions.



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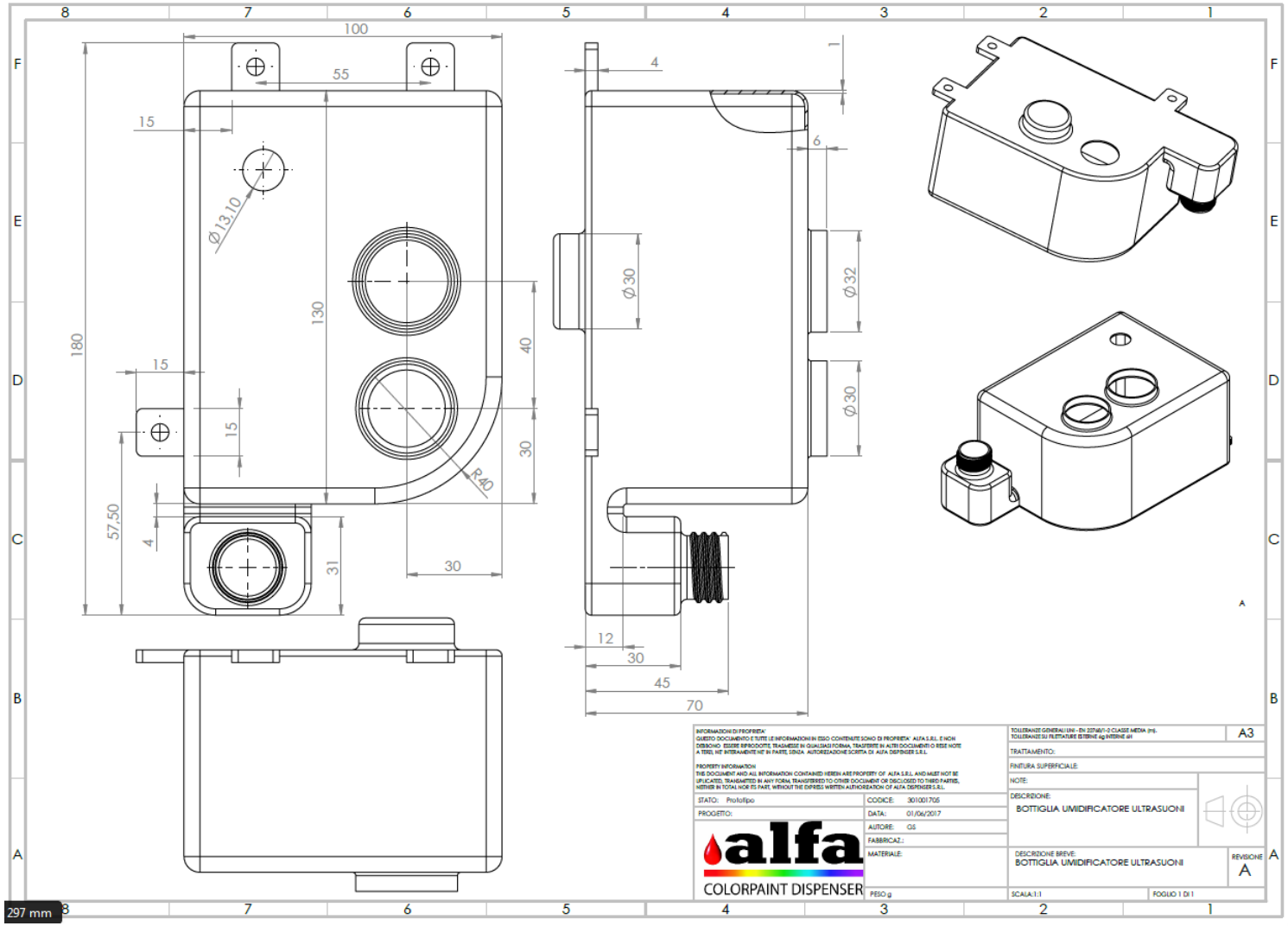
Technical data

Total bottle volume 1.000 cc.

- Max water volume: 470 cc
- Min water volume: 200 cc
- Refil volume: 470 – 200 = **270 cc**
- Nozzle air volume when closed: 60 cc
- Max volume air:
  1.000 – 200 = 800 cc
- Min volume air:
  1000 – 470 = 530 cc

Nozzle air volume is from 1/9 and 1/13 respect the humid air volum inside the bottle



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Technical data

Experimental water consumption with:

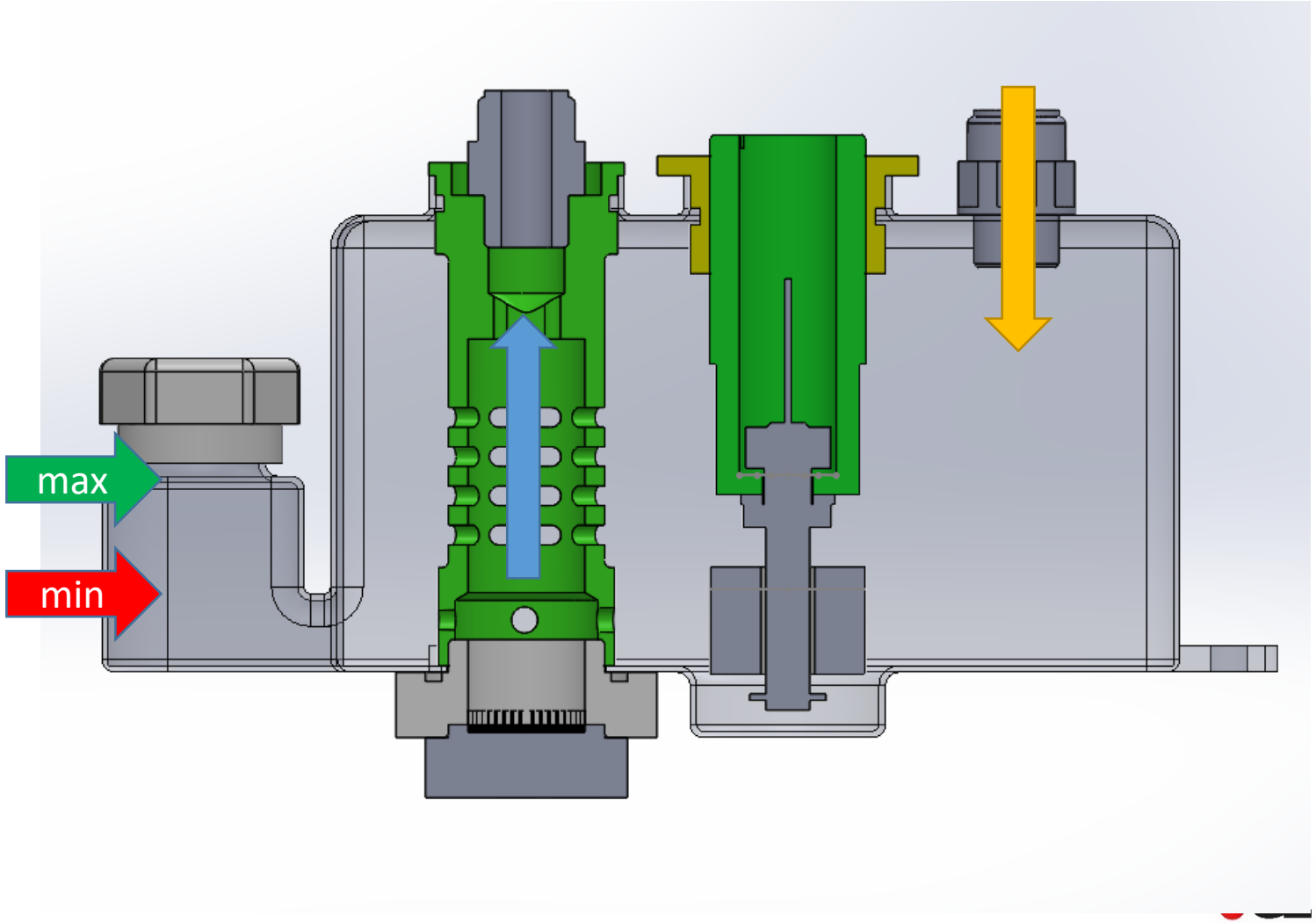
- Open cap
- 25 °C
- Continous running:

10 cc / Hour

Hours before refilling

270 cc / 10 cc ora = 27 ore

In operative conditions refilling will be needed every 20, 30 days. (Experimental data from our Lab)



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Ultrasonic wave generator advantges

Let’s comper this solution with status of the art rapresented by air bubbler generator in hot water:

- Ultrasonic generator works with water at ambient temperature, this avoid drain in nozzle when hot moisure get in touch again with ambient temperature
- The efficiency is higher by far. With ultrasounds water mollecolas are broken directly generating moisture.
- As per water mollecolas also bactirias and algaes mollecolas are broken killing the same

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