

List of components and suppliers

When assembling the component lists for both the prototype and the final product, intentional differences were made to suit the functional needs of each development phase.

Prototype

Since the prototype will be a scaled down version of the final product we left some components out. The prototype was designed with simplicity and flexibility in mind, allowing us to test the supplement dispenser.

- **Two electric motors** are used to test the possibility of dispensing different supplement. This setup allowed us to experiment with different configurations during testing.
- We opted for **standard electrical power connections** instead of solar energy to ensure a stable power supply throughout the testing process. This made it easier to make adjustments without being limited by sunlight or outdoor conditions and the budget was too small for it.
- Components such as **solar panels and the MPPT charger** were excluded at this stage, as they are not critical for basic functionality testing.

Final product

The final product's component list includes all elements required for a fully functional hydration station:

- **Solar panels and an MPPT charger controller** were added to save electricity cost and make it more sustainable.
- **Five motors** are used in the final design to add all the different supplements
- Additional elements like an **inner and outer stainless steel casing**, filters, adapters, and mounting materials were included to ensure durability, safety in practical conditions.

List of components and suppliers for the final product

Component	Quantity	Price with VAT (€)	Link
High-pressure water pump (12 V or 24 V)	1	44.11	12 VDC 72 W Good Pumps Micro Electric Diaphragm Reflux Water Pump Automatic Switch 6 L/Min High Type Pressure Amazon.es: Industrial e Científico
Solenoid Valve	1	9.96	https://www.digikey.pt/en/products/detail/seed-technology-co-ltd/1119
Button Head Hex Drive M4 Screw	2	5.32	Parafuso Allen M4 com Cabeça Cônica - Jitsie - Trialmotor - Off Road Motor
Plain Washers ISO 10673-4.55	28	26.05	Anilha Plana DIN 125 Aço 140HV Zincado M 4 INTEC
Hex Nuts ISO 4032-M4-W / DIN 934	18	1.99	Porca Hexagonal DIN-934 40un - 03393-756 Armazéns Reis
Hexalobular Socket Pan Head Screws M4 x 20 x 18.6 -4.8	2	3.56	Parafuso cabeça queijo hexalobular ISO 14583 Aço Zincado 4.8 (24425) F
Plain Washers ISO 7091-10	9	0.89	Anilha plana DIN 126 Aço Galvanizado a quente 100 HV (38740) Fabory
Hex Screws DIN EN 24014 - M10 x 80 x 26	9	6.3	Parafuso de metais cabeça hexagonal M10X80 classe 10.9 Aço zinco bran
Hexalobular Socket Pan Head Screws - ISO 14583 - M4 x 14 x 12.6 - 4.8	10	1.5	Parafuso M4 4*14mm Aço Inoxidável 304 Allen Hexagonal (Stainless steel screws) - AIMSOAR
Component Adapters custom made 25 x 25 x 25 mm	7	35.00	F. Marques da Silva Carnaxide Porto
3D printed rotor	1	-	We will ask if it possible to 3D print
Flow sensor (water)	1	11.14	314150005 Seed Technology Co., Ltd Sensors, Transducers DigiKey
InfraRed (Bottle identification)	1	2.90	https://www.botnroll.com/en/infrared/3040-infrared-proximity-sensor-fun
LEDs or LCD status display	1	7.65	https://mauser.pt/catalog/product_info.php
Push button (for fill-in start)	1	12.70	Metal illuminated Switch-Green (12V) Ring
ESP32 board	1	10.45	https://pt.mouser.com/ProductDetail/Esspressif-Systems/ESP32-DevKitC-
Battery	1	81.32	ECO-WORTHY Bateria LiFePO4 de 12 V 30 Ah com proteção BMS e máx. 13384 Wh para campismo, 12 V e 30 Ah para auto-caravanas, motor de trolling Amazon.es: Industrial e Científico
Mppt charger controller	1	30.49	DOKIO Painel solar 100 W 12 V monocristalino de alta eficiência resistente a casa de jardim, barco, casa, campismo : Amazon.es: Industrial e Científico
Solar panel	1	66.06	VIXKPIRR MPPT 30A Controlador de carga solar automático de 12 V 24 V, re com 4 portas USB sensor temperatura e ecrã LCD, para adequado 12 V 24 V Amazon.es: Industrial e Científico
Electric Motor	5	33.75	169 Adafruit Industries LLC Motors, Actuators, Solenoids and Drivers Digi
10 kΩ resistor	3	0.33	MFR-25FRF52-10K YAGEO Resistors DigiKey
flyback diode	2	0.62	1N5819 Diotec Semiconductor Discrete Semiconductor Products DigiKey
N-MOSFETs	2	2.86	IRLZ44NPBF Infineon Technologies Discrete Semiconductor Products D
DC-DC converter (12 V to 5 V)	1	2.95	DC-DC Buck Converter Step-down 12V to 3.3V/5V Power Supply Module
Inner plate (stainless steel) (0.39 m²)	1	16.00	Chapas aço inoxidável
Outer-case (stainless steel) (0.5 m²)	1	16.00	Chapas aço inoxidável
Carbon filter	3	3.00	Pack 3 filtros de 10" para osmose STANDARD PURAGUA Leroy Merlin
Food-grade silicone tubing	1	4.29	Mangueira técnica GEOLIA FITT 5M D4MM TRANSPARENTE Leroy Merlin
Carbon filter casing	1	19.39	Recipiente para filtros 10" Leroy Merlin
Supplement tubes D 20	1	2,69	Tubo rígido PVC VD20 CINZA 3M Leroy Merlin
Soldering Supplies	1	14.78	Fio Fluxado (Auto-Protegido) 0.9mm 500Gr Magmaweld FFLSGAS02
Square Pipes (stainless steel)	1	20.90	https://intec.pt/pt/product/anilha-plana-din-125-aco-140hv-zincado-m-4

Total price with VAT (€)

494.95

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Components	Quantity	Price with VAT (€)	Link
Solenoid Valve	1	9.96	https://www.digikey.pt/en/products/detail/seeed-technology-co-ltd/111990004/5488162
Flow sensor	1	11.14	314150005 Seeed Technology Co., Ltd Sensors, Transducers DigiKey
InfraRed (Bottle identification)	1	2.90	Infrared Proximity Sensor - Funduino
LEDs or LCD status display	1	7.65	https://mauser.pt/catalog/product_info.php
Push button (for fill-in start)	1	12.70	Metal illuminated Switch-Green (12V) Ring
ESP32 board	1	10.45	https://pt.mouser.com/ProductDetail/Esspressif-Systems/ESP32-DevKitC-VE
Electric Motor	2	13.50	169 Adafruit Industries LLC Motors, Actuators, Solenoids and Drivers DigiKey
10 kΩ resistor	3	0.33	MFR-25FRE52-10K YAGEO Resistors DigiKey
Flyback diode	2	0.62	1N5819 Diotec Semiconductor Discrete Semiconductor Products DigiKey
N-MOSFETs	2	2.86	IRLZ44NPBF Infineon Technologies Discrete Semiconductor Products DigiKey
12 V, 3 A Power Supply	1	12.04	Adaptador de alimentação 12 V 3A, carregador universal 100 - 240 V para LED, CCTV, Router, conector de 5,5 x 2,1 mm, cabo de 1,5 m, fonte de alimentação UE : Amazon.es: Eletrónica
DC-DC converter (12 V to 5 V)	1	2.95	DC-DC Buck Converter Step-down 12V to 3.3V/5V Power Supply Module
Food-grade silicone tubing	1	4.29	Mangueira técnica GEOLIA FITT 5M D4MM TRANSPARENTE Leroy Merlin
3D printed rotor	1	-	We will ask if it's possible to 3D print it

Total price with VAT (€)

91.39

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