

COMMUNITY WATER SUPPLY

# AQpure water treatment systems



MODULAR AND  
AUTOMATED ULTRAFILTRATION  
WATER TREATMENT FOR  
**SUSTAINABLE DRINKING WATER**

# ONSITE WATER TREATMENT FOR COMMUNITY **DRINKING WATER SUPPLY**

Grundfos AQpure is an ultrafiltration-based water treatment system optimised for onsite treatment of raw water, whether the water source is surface water, groundwater or rainwater harvesting.

Grundfos AQpure ensures drinking water supply for communities and for emergency situations in remote areas, including areas where off-grid power supply is required. These communities are often characterised by plenty of available water that is not safe to drink. Furthermore, access to technical capabilities may be poor.

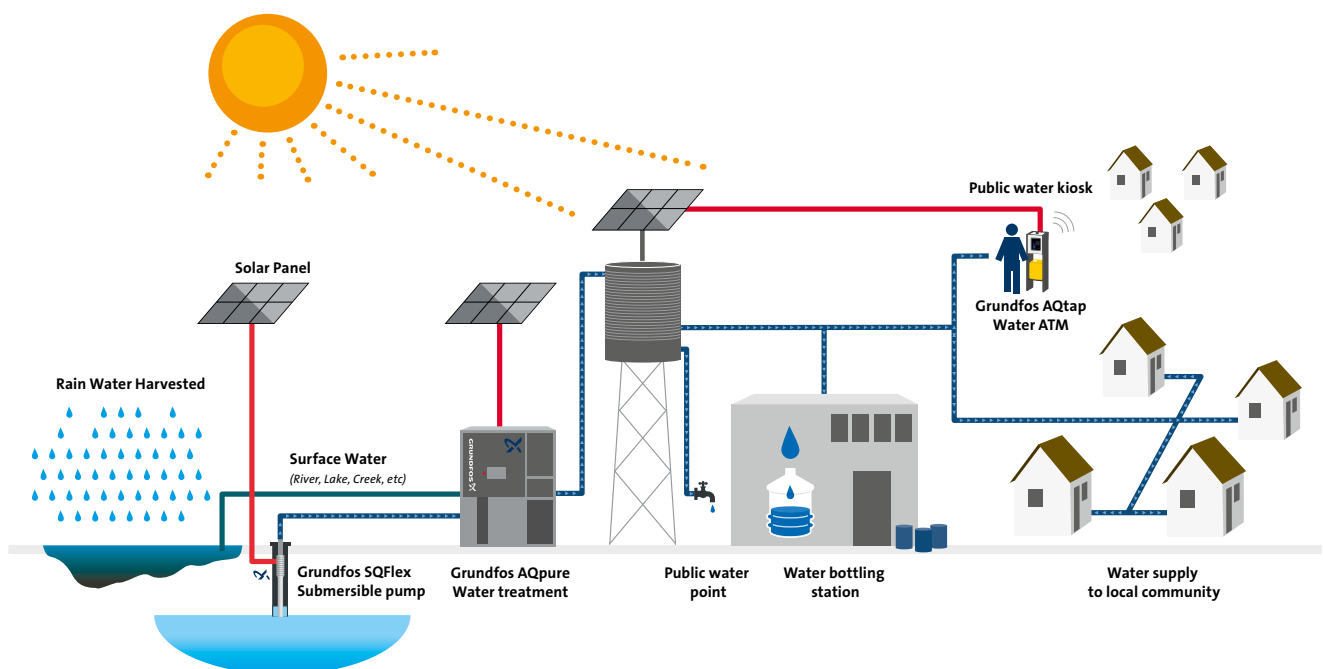
An additional problem may be fluctuations in water quality and demand that impact costs. A high level of cost sensitivity – the cost of extracting and treating water, and the ability of the community to pay – also highlights the need

for accountability and usable data in the water management system.

Typical applications for Grundfos AQpure are:

- **PUBLIC WATER POINTS**
- **WATER KIOSKS** combined with Grundfos AQtap water ATMs for revenue collection, transparency and smart water service management.
- **WATER BOTTLING STATIONS AND MOBILE WATER CONTAINERS** for emergency situations.

## TYPICAL OFF-GRID COMMUNITY APPLICATIONS



# FULL ADAPTABILITY FROM A MODULAR CONCEPT

Thanks to the modular concept, each AQPure system can easily be customised to the specific raw water quality of your site. Simply identify which of the four categories best characterises your raw water and configure your water treatment system from the 10 standardised modules.

Configuration of your Grundfos AQPure system is a **THREE-STEP PROCESS:**

## STEP 1 Identify which of the four water categories best characterises your raw water

	WATER QUALITY PARAMETER	BLUE WATER Ground water, rain water or public water	GREEN WATER Pond water	BROWN WATER River water in wet season	ORANGE WATER Rivers and lakes in tropical areas
Solids	Turbidity (NTU)	< 3	3 - 10	10 - 100	10 - 100
	TSS (mg/l)	< 5	5 - 10	> 10	5 - 50
	SDI <sub>15</sub>	< 5	< 5	< 5	> 5
Dissolved organics	DOC (mg/l)	< 5	5 - 10	< 5	10 - 20
	UV <sub>254</sub> (1/m)	< 0.1	0.1 - 0.3	> 0.5	0.3 - 0.5
	COD (mg/l)	< 15	15 - 30	< 15	30 - 50
	Oil (mg/l)	< 0.1	0.1 - 0.3	< 0.1	0.3 - 0.5
Dissolved inorganics	Fe/Mn (mg/l)	< 0.05	0.05 - 0.2	> 1	> 0.5
	Water hardness (mg/l)	< 60	< 60	> 60	> 60
	Conductivity (µS/cm)	< 500	< 500	500 - 1,000	500 - 1,000

## STEP 2 Select the appropriate combination from 10 standard modules – follow the configuration table below.

	UF PROCESS ONLY	BLUE WATER Ground water, rain water or public water				GREEN WATER Pond water		BROWN WATER River water in wet season		ORANGE WATER Rivers and lakes in tropical areas	
COMBINATION NO.	C1 <sup>1)</sup>	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
MODULES	Self-cleaning prefilter	-	-	-	-	✓	✓	✓	✓	✓	✓
	Standard UF	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓ <sup>2)</sup>	✓	✓	✓	✓	✓	✓
	Air scouring	-	-	-	✓	✓	-	✓	✓	✓	✓
	Chlorination	-	✓	-	✓	-	✓	✓	✓	-	✓
	Internal CIP	-	-	-	-	-	✓	✓	-	-	✓
	Level sensing	□	□	□	✓	✓	□	✓	□	✓	□
	Activated carbon filter	-	-	-	✓	✓	-	✓	-	✓	-
	Distribution	□	□	□	✓	✓	□	✓	□	✓	□
	Solar package	□	□	□	□	□	□	□	□	□	□
	Remote management	□	✓	✓	✓	✓	✓	✓	✓	✓	✓

✓ Built-in module   □ Optional module   - Not selectable   <sup>1)</sup> Must be combined with auxiliary equipment   <sup>2)</sup> Includes 300 µm strainer

## STEP 3 Add optional modules – if you have identified specific local requirements

# 10 MODULES FOR COMBINATION:

## 1 Self-cleaning prefilter

Long life membrane  
Long service intervals

## 2 Standard UF

Self-regulation  
High energy efficiency  
Flexible installation.

## 3 Air scouring

Long service intervals  
Reduced chemical  
consumption for CIP

## 4 Chlorination

Long service intervals.  
Residual chlorine in  
purified water

## 5 Internal CIP

Stable production  
Long service intervals

## 6 Level sensing

External tank level control

## 7 Activated carbon filter

Removal of chlorine,  
dissolved organics,  
pesticides, taste and odour

## 8 Distribution

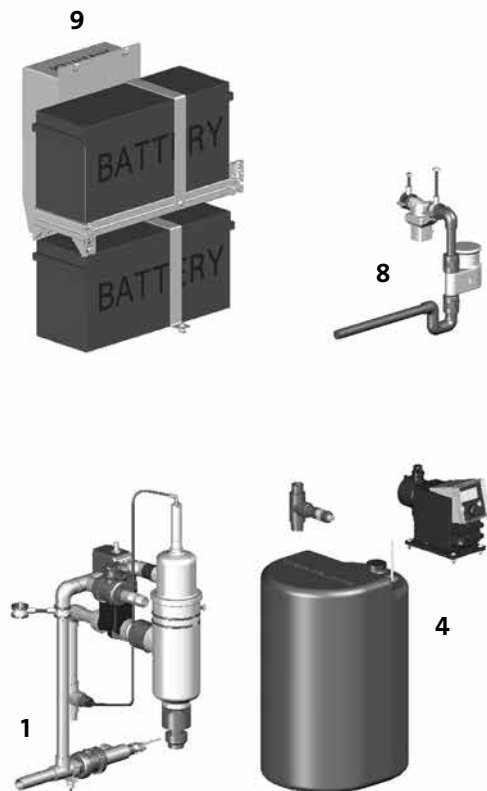
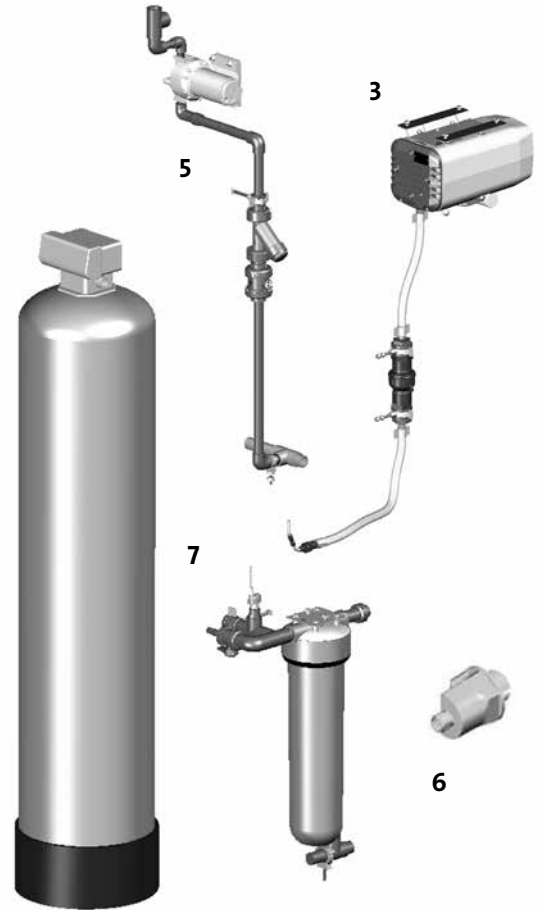
Direct water tapping or  
pumping to an external  
tank

## 9 Solar package

Power supply by solar  
energy. Reduction of  
operational cost

## 10 Remote management

Remote monitoring of  
operational status and  
performance



# MINIMAL DOWNTIME AND OPTIMAL RELIABILITY

An AQpure water treatment system benefits everyone involved in ensuring clean drinking water supply for remote or off-grid areas:

## Optimal reliability and long service intervals

Professional service and support is carried out by local partners certified by Grundfos and is only required 1 to 4 times a year, depending on the raw water quality. The UF membrane is kept clean using anti-fouling procedures, including back-washing, cleaning-in-place (CIP) or air scouring. Our unique and patented control algorithm automatically combines the anti-fouling procedures in an optimal way to ensure robust use and extended intervals between service.

## Self-adaptive

AQpure is self-adapting, meaning the Grundfos-patented controller optimises the system's set-up values continuously, adjusting operational parameters according to variations in the feed water quality. Ensuring a constant drinking water quality outcome (with a turbidity <0.5 NTU and 99.9999% bacteria elimination), this feature allows the maximum usage of the produced water and extends the membrane's lifetime.

## Remote monitoring for easy maintenance planning

Grundfos iSOLUTIONS CLOUD is a secure browser-based system that monitors your installation and keeps planning of your service visits straightforward and effective for you, reducing downtime and optimising reliability.

## SAY YES TO

- **Modularity and adaptability**
  - **Optimised reliability**
  - **Self-adaptive control**
  - **Remote monitoring**
  - **Solar powering**
- SAY **NO** to complexity
  - SAY **NO** to downtime
  - SAY **NO** to inferior performance
  - SAY **NO** to poor system control
  - SAY **NO** to excessive operating costs

## MEETING THE DRINKING WATER NEEDS OF 15 VILLAGES IN SOUTHERN THAILAND

In a remote and troubled area close to the Malaysian border, 15 mobile solar-drinking water systems with AQpure water treatment are installed. Just one of these units serves approximately 5,000 people with drinking water as part of customised mobile water supply containers. The plug-and-play containers are easily transportable, to minimise local installation requirements.





# VARIATIONS IN RAW WATER QUALITY OVERCOME FOR STABLE AND COST-EFFECTIVE COMMUNITY DRINKING WATER SUPPLY IN BARRIO CAÇULA, BRAZIL

SABESP is one of the largest water companies in the world, providing clean water and wastewater treatment for more than 27 million inhabitants in the state of Sao Paulo, Brazil. They have recently chosen an AQpure drinking water treatment plant to improve their drinking water services for a small rural community, Barrio Caçula, with around 500 inhabitants, located 235 km south of Sao Paulo.

The surface raw water source is a creek, and during the rainy season, the turbidity increases drastically, as does the amount of suspended matter, including bacteria and other harmful particles. The usual method for treatment was a conventional sand filter, with chlorination as the disinfection method.

However, this treatment technology was not capable of treating the water properly, so SABESP needed to stop the

water supply in the rainy season. The filters were not able to handle the variations in turbidity, increasing the need for maintenance support in this remote area with difficult access. As a consequence, the population ended up having no safe water supply for long periods.

## Robust ultrafiltration matches challenges

Grundfos AQpure proved to be the perfect solution, not least because of the robustness of the ultrafiltration technology as a physical barrier for suspended matter, and for the ability to self-adapt its performance when faced with the large variation in raw water quality.

Quick installation and commissioning and an easy transition from conventional treatment to the AQpure ensured that the investment required was very low. Furthermore, autonomy of operation and long service intervals between preventive maintenance mean SABESP has quickly reduced its operational costs.

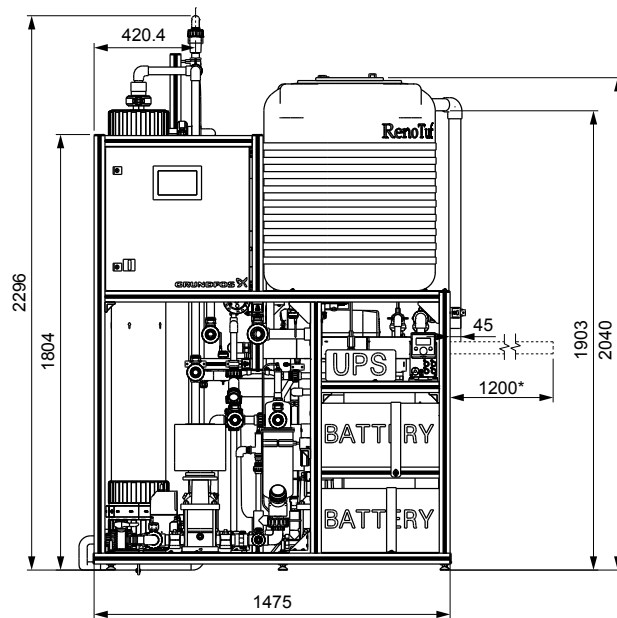
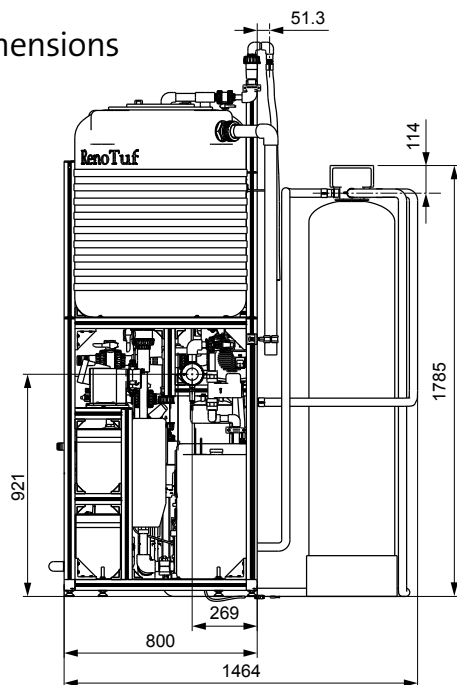


## TECHNICAL SPECIFICATIONS



Water production	Up to 2 m <sup>3</sup> /h
Membrane type	Hollow fibre, dead-end, outside-in
Membrane material	PVDF
Membrane pore size	0.03 µm
Control strategy	Parametric to be very flexible
Inlet pressure	Max. 1 bar at 1m <sup>3</sup> /h
Power supply	200-240 V, 1-phase, 50/60 Hz
Control interface	PLC based 7" touchscreen
Weight	Empty: 400-615 kg; Filled: 750-1165 kg
Dimensions	Max. length 1600 mm, max. width 800 mm, max. height 2300 mm

## Dimensions



\* Space required for maintenance of UV disinfection module.

# CONTACT GRUNDFOS

Contact your local Grundfos sales representative to find out more about Grundfos AQpure and our holistic Lifelink solutions.

Sustainable water solutions that change lives can only be achieved through long-standing partnerships across sectors.

Grundfos Lifelink can help you with:

- Enabling funding
- Advising about feasible business models
- Engaging as a committed technology and know-how partner
- Finding and linking suitable partners for each project from our broad network of trusted partners



## Grundfos Lifelink water solutions

Lifelink is our commitment to provide sustainable water solutions in the developing world that can be customised according to project needs, delivering reliable water supply, supporting revenue collection and efficient operations. Our high quality, intelligent water solutions tailored to the developing world are built on innovative technology and mobile connectivity. Grundfos Lifelink water solutions combine our innovative and reliable technology with professional service networks to support operations on the ground.

For more information, please visit: [www.grundfos.com/lifelink](http://www.grundfos.com/lifelink)