AQtap

Water dispenser

Installation and operating instructions

GRUNDFOS

Original installation and operating instructions.

These installation and operating instructions describe Grundfos AQtap and aqTOP.

Sections 1-6 give the information necessary to be able to unpack, install and start up the product in a safe way.

Sections 7-14 give important information about the product, as well as information on servicing, fault finding and disposal of the product.

CONTENTS

Caution	Prior to installation, read these installation and operating instructions. Installation and operation must comply with local regulations and accepted codes of good practice.

Note	These installation and operating instructions are also available on www.grundfos.com.

Note	This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

1. General information

Note	These installation and operating instructions apply to both AQtap and aqTOP, except information given on hydraulic parts, water connection, water tapping, which only apply to AQtap water dispensers.

"AQtap" in this document will include aqTOP, unless differences are stated specifically.

1.1 Target groups

These installation and operating instructions contain general instructions that must be observed during installation, startup, operation and servicing of the product. The responsible service staff must read these installation and operating instructions prior to any work at the

product. These installation and operating instructions must be available at the installation location at all times.

1.1.1 Qualification and training of staff

The staff responsible for the installation, startup and servicing must be trained for these tasks. Areas of responsibility, levels of authority and the supervision of the staff must be precisely defined by the operating company.

1.1.2 Obligations of the operating company

- Observe the local safety regulations.
- Instruct the operating staff.
- Provide the stipulated safety equipment and personal protective equipment.
- Arrange regular maintenance.

1.1.3 Obligations of the service personnel

- Read this manual thoroughly before putting the product into operation.
- Observe the recognised health and safety regulations as well as the accident prevention regulations.

1.2 Symbols used in this document

WARNING

If these safety instructions are not observed, it may result in personal injury.

WARNING

If these instructions are not observed, it may lead to electric shock with consequent risk of serious personal injury or death.

| Caution |
If these safety instructions are not observed, it may result in malfunction or damage to the equipment.

| Note |
Notes or instructions that make the job easier and ensure safe operation.

1.3 Safety-related symbols on the product

Symbol	Description
▢	This is an electrical safety class II product.
♻	This product complies with directive 2006/66/EU and contains batteries which should not be disposed of with other household waste, but must be collected separately.
	Before obtaining access to terminals, all supply circuits must be disconnected.

All signs and symbols on the product must be observed and maintained legible.

2. Safety instructions

The following safety instructions must be observed during installation, operation and servicing of the product. The safety instructions will appear again in the relevant sections.

Non-observance of the safety instructions may have dangerous consequences for the staff, the environment and the product and may result in the loss of any claims for damages.

Should you require further information, please contact Grundfos.

2.1 Safety instructions used in this document

DANGER
POISONING

Improper use can lead to personal injury!

The AQtap dispenser must be used with water complying with WHO drinking water standards.

All parts and materials used in the hydraulic system must be suitable for drinking water appliances.

Improper use can lead to damage to the equipment!

Caution

The AQtap dispenser must be used with water complying with WHO drinking water standards and technical data.

The AQtap interface must only be operated with smart cards and with fingers.

DANGER
ELECTRIC SHOCK

Switch off the power supply, both grid and solar, before making any connections.

The AQtap cabinet must only be opened by authorised and qualified staff.

All electrical connections must be carried out by a qualified electrician in accordance with local regulations.

Stripped parts of wires must not protrude from terminals.

DANGER
ELECTRIC SHOCK

AQtap with grid power supply must be connected to an external mains switch with a minimum contact gap of 3 mm in all poles.

If an AQtap with grid power supply is connected to an electric installation where an earth leakage circuit breaker (ELCB) is used as an additional protection, this ELCB must trip when earth fault currents with DC content (pulsating DC) occur. The ELCB must be marked either with the left symbol or with both symbols shown below.

DANGER
ELECTRIC SHOCK

If the electrical mains connection is damaged, it must be replaced by Grundfos, a Grundfos service partner or a similarly qualified specialist, in order to avoid a hazard.

All servicing work must be carried out by authorised and qualified staff.

Shut down the whole system before any work at the system components and lines!

Switch off the power supply, both grid and solar, before carrying out servicing work or opening the cabinet.

Safety installations, which have been disabled during servicing, must be enabled again immediately after servicing.

2.1.1 Installation

Caution

The AQtap is not designed for built-in appliances.

Caution

The AQtap water dispenser must be mounted vertically.

Caution

The AQtap must be supplied with water via a pipe with 3/4" inner diameter, not via a hose.

Caution

The galvanic separator (hydraulic part) must be installed in front of the AQtap to avoid galvanic effects (damages) in the unit.

Caution

The strainer must be installed in front of the AQtap to prevent particles from entering the unit. The strainer must be installed horizontally with the filter piece pointing downwards. The strainer must be kept clean.

Note

Install and operate the AQtap in accordance with national health and safety regulations, or any national rules that may be applicable.

2.1.2 Solar panel connection

| Caution | Ensure correct polarity! Check the polarity with a multimeter before connecting the cables from the solar panels. |

2.1.3 Handling of batteries

| Caution | Do not short-circuit the two poles of the batteries. Ensure correct polarity! |

| Caution | The internal battery is supplied charged. As soon as it is connected there is power on the AQtap. |

An external battery replaces the internal battery.

Use a 12 V rechargeable lead acid battery.

| Caution | The cables of the internal battery must be disconnected both in the power supply unit and at the battery, and they must be removed from the AQtap to avoid unintended connection between parts. |

2.1.4 Antenna installation

| Caution | The internal antenna that is mounted to the top of the cabinet must not be removed or loosened, in order to ensure IP45 protection class. |

2.1.5 Technical data

| Caution | The values stated in the technical data must be adhered to. |

Technical data of water dispenser

Q1: 0.16 m³/h
Q2: 0.25 m³/h
Q3: 1.60 m³/h
Q4: 2 m³/h
Min. tapping volume: 0.4 l
Accuracy: 5% for Q1 to < Q2 2% for Q2 to Q4 ± 1 litre for 0-10 litre per tapping
Protection class: IP45

Inlet and outlet connections

- 1/2" external thread directly at the AQtap
- to be installed with 3/4" accessories and water supply

Batteries

The batteries comply with the battery directive (2006/66/EC).

The non-rechargeable lithium battery included in the AQtap control unit does not contain mercury, lead and cadmium.

Battery type	CR2032 lithium battery, 3 V, 230 mAh

The rechargeable nonspillable AGM lead-acid battery (internal standby battery) included in the AQtap as a backup battery contains lead, it does not contain mercury and cadmium.

Voltage supply	battery 12 V, 18 Ah
Charging current	max. 4.5 A
Orientation of the battery with regards to polarity	• left pole: minus (-) pole, blue cable • right pole: plus (+) pole, red cable
AGM battery	filled with absorbing glass fibre mats, so no liquid can leak out

Ambient condition requirements

Ambient temperature	1-50 °C
Max. relative humidity	95 % (non-condensing)
Mounting	designed for wall-mounting, protected from direct sunlight and rain

Water supply requirements

Water quality	complying with WHO drinking water standards
Water pH	5-9
Water particle content	particle size max. 0.5 mm • always install with supplied strainer
Water temperature	0.1 - 40 °C
Inlet pressure range	0.02 - 0.4 MPa (0.2 - 4 bar)

Power supply requirements

The AQtap can be used in the entire range from 110 V up to and including 240 V.

Power supply	• grid power AC connection: 110 - 240 V, 50/60 Hz • solar panel DC voltage: 15 - 45 V / 3 A
Max. power consumption	45 W

2.1.6 Disposing of the product

The batteries must be removed, before the product is disposed of. The waste batteries should be disposed of through the national collective schemes.

Use appropriate waste collection services. If this is not possible, contact the nearest Grundfos company or service workshop.

3. Receiving the product

3.1 Transporting the product

Caution	Do not throw or drop the AQtap. Grundfos accepts no liability for damage caused by incorrect transportation or missing or unsuitable packaging of the product!

- The AQtap is delivered in a cardboard box with protective inserts. Keep the AQtap in the packaging during transport and intermediate storage.
- Retain the packaging for future storage or return, or dispose of the packaging in accordance with local regulations.
- Return the AQtap in its original packaging or equivalent.

3.1.1 Intermediate storage

- Keep the AQtap in its original packaging.
- Store indoors, protected from direct rain and sun.
- Permissible storage temperature: -10 °C to +50 °C.
- Permissible air humidity: max. relative humidity: 95 % (non-condensing).

3.2 Unpacking

Before installation, the following checks should be made:

1. Check that the AQtap has not been damaged during transportation.
2. Check that the specifications of the AQtap correspond to the order. See nameplate.
3. Check the scope of delivery.

3.3 Scope of delivery

3.3.1 AQtap

The AQtap scope of delivery comprises the following:

- AQtap unit
- 2 unique keys and 1 standard cabinet key
- mounting material (4 screws, 4 dowels, 4 tightening washers, 4 nuts)
- galvanic separator
- strainer
- AQtap water tapping guide
- AQtap installation and operating instructions

3.3.2 aqTOP

The aqTOP scope of delivery comprises the following:

- aqTOP unit
- 2 unique keys and 1 standard cabinet key
- mounting material (4 screws, 4 dowels, 4 tightening washers, 4 nuts)
- AQtap installation and operating instructions

3.3.3 Starter package

One starter package is created for each new Water Management System group. The starter package, which is sent to the customer directly, comprises the following:

- 2 activated AdminCards
- 1 activated ServiceCard
- AQtap installation guide
- AQtap Water Management System guide

4. Installing the product

DANGER

ELECTRIC SHOCK

Switch off the power supply, both grid and solar, before making any connections.

The AQtap cabinet must only be opened by authorised and qualified staff.

All electrical connections must be carried out by a qualified electrician in accordance with local regulations.

Stripped parts of wires must not protrude from terminals.

| Note | Installation is illustrated in the installation guide supplied with the AQtap. |

4.1 Installation sequence

The order of installation and electrical connections must be observed:

1. *Mechanical installation*
2. *Hydraulic installation*
3. *SIM card preparation and installation*
4. *Electrical connection*: *Grid connection* and / or *Solar panel connection*
5. *Electrical connection*: *Internal battery* or *External battery*

4.2 Location

| Caution | The AQtap is not designed for built-in appliances. |

| Caution | The AQtap water dispenser must be mounted vertically. The aqTOP can be installed vertically or horizontally. |

| Caution | If the AQtap is installed outdoors, a canopy must be installed to protect the AQtap against direct sunlight, overheating and rain. |

| Caution | If the AQtap is not mounted, the holes must remain sealed with the sealing caps. |

- The AQtap can be installed outdoors or indoors.
- The AQtap must be mounted vertically on a straight, flat wall. The wall must be able to hold the weight of the AQtap
  – aqTOP can be mounted vertically or horizontally.
- The AQtap must be permanently connected to the water mains.

Observe section *Ambient condition requirements*.

4.2.1 Minimum space

The minimum space requirement for the AQtap is 1.65 m of height and 0.5 m of width. Under the AQtap, space must be provided for the water inlet connection with galvanic separator, 90° elbow, strainer and shut-off valve. The space under the AQtap must be sufficient to tap water into a canister. Above the AQtap, space must be provided for the antenna.

4.3 Tools and material

The following tools and material are needed for installation of the AQtap, they must be provided by the customer.

4.3.1 Tools

- drilling device (d = ∅10 mm, l = 50 mm)
- water-level
- yard stick
- torque wrench
  – torx TX25, TX10
  – screwdriver for slotted screws
- adjustable spanner
- flat pliers
- cutter
- pencil

4.3.2 Material

For the requirements for the material see sections *4.6 Hydraulic installation*, *4.7 SIM card preparation and installation* and *4.8 Electrical connection*

- outlet connector and hose
- 90 ° brass elbow, 3/4", male/female connection
- shut-off valve, 3/4"
- SIM card
- cables for the power input
  – grid
  – solar
  – external battery
- all-pole disconnection switch
- fuses

4.4 Opening the product

DANGER

ELECTRIC SHOCK

The AQtap cabinet must only be opened by authorised and qualified staff.

To open the AQtap, unlock the upper lock with one of the unique keys and the lower lock with the standard cabinet key.

4.5 Mechanical installation

4.5.1 Mounting the product
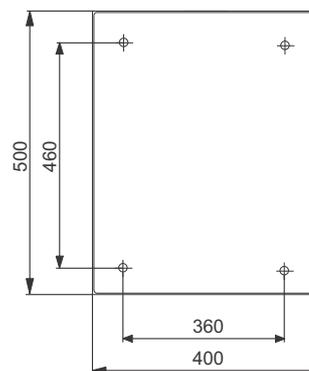
Fig. 1 Drilling scheme

1. Choose an appropriate mounting place, see section *4.2 Location*.
2. Mark the 4 drilling points at the mounting place according to the drilling scheme.
3. Drill the 4 holes d = ∅10 mm, 50 mm deep.
4. Insert the 4 dowels in the drilled holes.
5. Screw the 4 screws into the dowels with an adjustable spanner. The thread rod must point outwards, the wood screw part must be completely screwed in.
6. Place the AQtap cabinet on the 4 screws, flat to the wall.
7. Place the 4 washers on the screws.
8. Screw on the 4 nuts with a torque wrench M8, torque 5 Nm.

4.6 Hydraulic installation

| Caution | The AQtap must be supplied with water via a pipe with 3/4" inner diameter, not via a hose. |

| Caution | The galvanic separator (hydraulic part) must be installed in front of the AQtap to avoid galvanic effects (damages) in the unit. |

| Caution | The strainer must be installed in front of the AQtap to prevent particles from entering the unit. The strainer must be installed horizontally with the filter piece pointing downwards. The strainer must be kept clean. |

| Note | Install and operate the AQtap in accordance with national health and safety regulations, or any national rules that may be applicable. |

The AQtap has an inlet with an external thread of 1/2". A galvanic separator functions as reducing piece between 3/4" water supply pipe with accessories and the inlet at the AQtap.

The AQtap has an outlet with an external thread of 1/2" to connect a hose or a pipe.

The galvanic separator and a strainer must be installed at the inlet. Both are included in the product delivery. Use a 90° elbow, 3/4" to connect the strainer to the galvanic separator. The strainer must be installed horizontally with the filter piece pointing downwards.

A shut-off device must be installed in front of the AQtap for maintenance and service needs (available as an accessory).

If the inlet water pressure can exceed the allowed value, a pressure reducing valve or an elevated break must be installed in front of the AQtap.

Observe section *Water supply requirements*.

The AQtap water dispenser can be connected to an existing main water grid or a water tank. Minimise the number of bends in the water supply line, in order to avoid water flow reduction. The tank must be high enough for gravity feed. It is recommended that the tank outlet is at least 3 m above the AQtap inlet. If this is not possible, Grundfos can provide a booster pump. The tank should have a lateral water outlet to avoid sediment entering the AQtap. Install the tank in such a way that it can be emptied and cleaned.

Hydraulic connection

| Note | Leaking pipe connections will affect the efficiency of the system. Seal the threads with PTFE, hemp or similar resistant seal material. |

| Note | If a pressure reducing valve is used, see the installation and operating instructions supplied with the pressure reducing valve. |

1. Connect the water outlet:
   – Remove the protection cap from the water outlet.
   – Connect a hose or pipe with a union nut to the ½" external thread of the water outlet.
2. Connect the water inlet:
   – Remove the protection cap from the water inlet.
   – Seal the thread and screw the galvanic separator onto the ½" external thread of the water inlet.
   – Seal the thread and screw the 90° elbow onto the 3/4" external thread of the galvanic separator.
   – Seal the thread and screw the strainer onto the 3/4" external thread of the 90° elbow in correct orientation. See arrow indicating the flow direction on the strainer.
   – Seal the thread of the strainer and connect the water inlet.
   – Keep the shut-off valve closed until the AQtap cabinet is locked after installation.
3. Check that the connections are tight, mounting torque:
   – strainer: 30 ±3Nm
   – galvanic separator: 10 ±1Nm

4.7 SIM card preparation and installation

| Caution | Switch off the power supply, both grid and solar, and disconnect the battery before inserting the SIM card. The SIM card will not be read by the AQtap until it was powered off and on again. |

| Caution | Disable the PIN protection of the SIM card. PIN protected SIM cards lead to malfunction. |

| Note | Connect the AQtap to GSM network before creating it in WMS. This can reduce the speed connection time. |

| Note | The AQtap is operable without SIM card, see *7.10.5 Operating of offline AQtaps*. This manual assumes normal operation of AQtaps with connection to WMS. |

1. Conclude a mobile subscription with an approved mobile phone operator (telco).
   – Mini-SIM card (15 x 25 mm)
   – 2G machine-to-machine GPRS data subscription
   – Ability to send and receive international SMS messages
   – Ability to acquire a signal from the network operator you expect it to use
   – GPRS data subscription of 10 MB per month with automatic top-up
2. Insert the SIM card into a mobile phone, and set the "PIN code request" option to "OFF".
3. Write down the following:
   – Mobile phone number of the SIM card.
   – IMEI number of the CIM. The number is written on the sticker on the back side of the control unit.
4. Insert the SIM card into the CIM of the power-off AQtap. The SIM card will only be read after power-on.
   – Place the SIM card in the mould of the slide.
   – Slide the SIM card into the slot.

4.8 Electrical connection

4.8.1 Safety instructions

DANGER
ELECTRIC SHOCK
Switch off the power supply, both grid and solar, before making any connections.

The AQtap cabinet must only be opened by authorised and qualified staff.

All electrical connections must be carried out by a qualified electrician in accordance with local regulations.

Stripped parts of wires must not protrude from terminals.

DANGER
ELECTRIC SHOCK
AQtap with grid power supply must be connected to an external mains switch with a minimum contact gap of 3 mm in all poles.

If an AQtap with grid power supply is connected to an electric installation where an earth leakage circuit breaker (ELCB) is used as an additional protection, this ELCB must trip when earth fault currents with DC content (pulsating DC) occur. The ELCB must be marked either with the left symbol or with both symbols shown below.

| Caution | We recommend to use armoured cables or run cables in conduits on the outside of the AQtap. |

| Caution | All used and unused cable entries of the cabinet must be sealed after connection to prevent animals from entering the AQtap. |

4.8.2 General

Check that the supply voltage and frequency correspond to the values stated in section *13. Technical data* and on the nameplate.

The AQtap can be operated with grid and / or solar power. The internal battery is used as a backup power for approximately 12 hours of operation. If the internal battery is not powerful enough, it can be substituted by an external battery.

| Note | Depending on the solar radiation and degree of AQtap utilization, the internal battery and charging with solar power can be insufficient.
In cases where tapping is not possible after using the internal backup battery, an external battery with MPPT solar charger can be used. |

Observe section *Power supply requirements*.

4.8.3 Opening the power supply unit

1. Unscrew the screws at the front cover with a flat or torx screwdriver TX10.
2. Remove the front cover from the power supply unit.

4.8.4 Grid connection

| Note | For grid connection use a cable according to the following specification:
- wire cross section: 0.75 - 2.5 mm²
- cable diameter: Ø 7 mm - Ø 12 mm |

1. Pull the power supply cable through one of the bigger (M20) cable glands of the AQtap cabinet.
2. Lead the cable aside the internal battery without tension and then through one of the bigger (M20) cable glands of the power supply unit.
3. Strip the cable covering to a length of approximately 3 - 5 cm and the wires to a length of 7 mm.
4. Connect the wires to the power plug according to the imprint on the power board, and tighten the screws.
   – Connect phase line (L) to L, neutral line (N) to N and protective earth (PE) to the middle terminal with earthing sign.
5. Tighten the cable gland at the power supply unit and at the cabinet.
6. Proceed with solar power connection, or refit the front cover of the power supply unit and tighten the screws in the cover with 0.8 Nm.

4.8.5 Solar panel connection

| Note | For solar panel connection use a cable according to the following specification:
- wire cross section: 0.75 - 2.5 mm²
- cable diameter: Ø 7 mm - Ø 12 mm |

| Caution | Ensure correct polarity!
Check the polarity with a multimeter before connecting the cables from the solar panels. |

1. Pull the solar panel cable through one of the bigger (M20) cable glands of the AQtap cabinet.
2. Lead the cable aside the internal battery without tension and then through one of the bigger (M20) cable glands of the power supply unit.
3. Strip the cable covering to a length of approximately 3 - 5 cm and the wires to a length of 7 mm.
4. Connect the wires to the solar panel plug according to the imprint on the power board and tighten the screws.
5. Tighten the cable gland at the power supply unit and at the cabinet.
6. Refit the front cover of the power supply unit and tighten the screws in the cover with 0.8 Nm.

4.8.6 Internal battery

| Caution | The internal battery is supplied charged. As soon as it is connected there is power on the AQtap. |

| Caution | Do not short-circuit the two poles of the batteries. |

| Caution | Ensure correct polarity! |

• The cables of the internal battery are connected in the power supply unit and led through a cable gland.
• The red (+) cable is connected to the plus (+) pole of the battery.
• The blue (-) cable is placed securely, so it cannot touch the battery poles during transportation.

Connecting the internal battery

1. Connect the blue battery cable to the minus (-) pole (left side of the battery).

4.8.7 External battery

| DANGER
ELECTRIC SHOCK
Switch off the power supply, both grid and solar, before making any connections.
The AQtap cabinet must only be opened by authorised and qualified staff.
All electrical connections must be carried out by a qualified electrician in accordance with local regulations.
Stripped parts of wires must not protrude from terminals. |

An external battery replaces the internal battery.
Use a 12 V rechargeable lead acid battery.

| Caution | The cables of the internal battery must be disconnected both in the power supply unit and at the battery, and they must be removed from the AQtap to avoid unintended connection between parts. |

| Caution | Do not short-circuit the two poles of the batteries. |

| Caution | Ensure correct polarity! |

| Note | When connecting an external battery, it must be fully charged prior to connection. |

Disconnecting the internal battery

1. Open the power supply unit, see section *4.8.3 Opening the power supply unit*.
2. Disconnect the blue cable from the minus (-) pole of the battery.
3. Disconnect the red cable from the plus (+) pole of the battery.
4. Disconnect the cables from the terminals.
5. Pull the battery cables out of the gable gland.
6. Remove the cables from the AQtap.

Connecting the external battery

1. Pull the disconnected battery cables through one of the smaller (M16) cable glands of the AQtap cabinet.
2. Lead the cables aside the internal battery without tension and then through one of the smaller (M16) cable glands of the power supply unit.
3. Strip the wires to a length of 7 mm.
4. Connect the wires to the battery plug according to the imprint on the power board and tighten the screws.
5. Tighten the cable gland at the power supply unit and at the cabinet.
6. Refit the front cover of the power supply unit and tighten the screws in the cover with 0.8 Nm.
7. Connect the red battery cable to the plus (+) pole (right side of the battery).
8. Connect the blue battery cable to the minus (-) pole (left side of the battery).

4.9 Check the GPRS communication

Caution	The SIM card will not be read by the AQtap until it was powered off and on again. If the SIM card was replaced by a new one, the AQtap must be restarted, see section *11.2 Restarting the AQtap*.

As soon as the AQtap with a correctly placed SIM card is powered on, it tries to connect to the GSM network automatically. Two LEDs near the SIM card show the connection status.

- Check that the internal communication is ok:
  – The lower LED is permanently green or red.
- Check that the connection to GSM network is established:
  – First, the upper LED flashes yellow rapidly (1-second intervals). Once a network has been acquired, the upper LED flashes yellow slowly (3-second intervals). It can take several minutes to establish the connection.

If the AQtap is registered in WMS and data transfer is ongoing, the upper LED indicates the connection between AQtap and WMS.

- Check that the communication status is ok, see section *4.9.1 LEDs on AQtap CIM*

4.9.1 LEDs on AQtap CIM

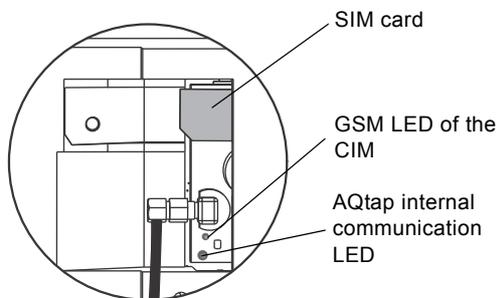LEDs indicate the internal and external communication status:

Fig. 2 LEDs on AQtap CIM

GSM LED of the CIM (top)

LED status	Description
Yellow LED, flashing with 1-second intervals	• No or invalid SIM card in the AQtap. • SIM card is PIN protected. • No GSM or no GSM coverage.
Yellow LED, flashing with 3-second intervals	• Connection to GSM network established. • Normal operation.
Green LED, flashing with 3-second intervals	• GPRS connection to WMS established. Ongoing data transfer with WMS.
Green LED, permanently on	• Ongoing SMS transfer with WMS. This is typically observed during initial configuration / commissioning with WMS.

AQtap internal communication LED (bottom)

LED status	Description
Red LED, permanently on	• AQtap has not received initial set-up data due to internal fault. • AQtap has not established a connection to WMS.
Red LED, flashing with 1-second intervals	• Cable or connector problem on the AQtap internal communication.
Green LED, permanently on	• AQtap internal communication status OK.

4.9.2 Abbreviations

Abbreviation	Description
CIM	Communication Interface Module (GPRS data logger)
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
IMEI	International Mobile Equipment Identity
LED	Light-Emitting Diode
SIM	SIM card, Subscriber Identity Module
SMS	Short Message Service
WMS	Water Management System

4.10 External antenna

The signal of the internal antenna is normally strong enough to have a stable connection to GSM. If the local conditions show that the antenna should be placed somewhere else in order to have a stronger signal, an external antenna can be used:

Description	Product No.
Antenna for roof mounting, GSM/GRM, with 15m cable	98518346

4.10.1 Antenna installation

Caution	The internal antenna that is mounted to the top of the cabinet must not be removed or loosened, in order to ensure IP45 protection class.
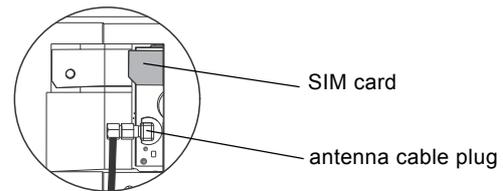
Fig. 3 Antenna cable connection

Disconnecting internal antenna

1. Unscrew the plug of the internal antenna cable from the CIM antenna connection.
2. Safely roll up the internal antenna cable, so it will not interfere with anything.
   – Do not remove the internal antenna, as this would destroy the IP45 protection class of the AQtap cabinet.

Installing external antenna

1. Pull the external antenna cable through one of the smaller (M16) cable glands of the AQtap cabinet.
2. Screw the external antenna cable plug to the CIM antenna connection.
3. Tighten the cable gland.
4. Install the external antenna at a location with good signal strength. Refer to the instructions given in the installation and operating instructions of the antenna.

4.11 Complete installation

1. Write the SIM card phone number on the back of the AQtap installation and operating instructions.
2. Place the AQtap installation and operating instructions in the AQtap cabinet.
3. Close the AQtap cabinet and lock it with the standard cabinet key and one of the unique keys.
   – Keep the unique keys securely, spare keys cannot be purchased. We recommend to keep one key as a master for copies in a safe place.
4. Open the shut-off valve.
5. Switch on the electrical power supply.
6. Attach the water tapping guide near the AQtap.
   – The water tapping guide gives a short introduction to water tapping for WaterCard holders.

5. Commissioning the product

AQtap water dispensers can only be operated after commissioning. The AQtap is automatically assigned to the same WMS group as the ServiceCard used for commissioning.

For more information on Water Management System (WMS), see *7.10 Water Management System (WMS)* and the manual which you can find online in the help section of WMS.

5.1 Commissioning requirements

• Installed AQtap, see *4. Installing the product*
• Activated ServiceCard, see *3.3.3 Starter package*
• SIM card to connect to WMS, see *4.7 SIM card preparation and installation*.
• SAT (site acceptance test) by means of the service menu / ServiceCard and performance test.

5.2 Service menu

For information on the user interface see *7.7 AQtap user interface*.

The AQtap service menu can be accessed with the assigned ServiceCard. It is used for:

• commissioning
• testing the buttons and lights
• setting the water price
• reading out warning and alarm codes
• restarting or resetting the AQtap

5.2.1 Entering the service menu

| **Note** | For first commissioning, decide on a 4-digit PIN code. This code cannot be changed later! |

| **Note** | To end the service menu, remove the ServiceCard at any point. |

1. Place the ServiceCard on the right smart card reader.
2. Enter PIN code.
3. Press "OK" to go to the next menu item.

5.2.2 Alarms

1. Alarm sign (red) and alarms are displayed:
   – The last 10 alarms are kept in a log, "1E" is the newest alarm, "10E" the oldest alarm.
   – The 3-digit code corresponds with a certain alarm.
   – The alarm sign is flashing when a current alarm is displayed, it is permanently lit for obsolete alarms.
   – To switch between alarms, press the "up" and "down" button.
   – For further details see section *11.1.2 Alarms*.
2. Press "OK" to go to the next menu item.

5.2.3 Warnings

1. Warning sign (yellow) and warnings are displayed:
   – The last 10 warnings are kept in a log, "1E" is the newest alarm, "10E" the oldest warning.
   – The 3-digit code corresponds with a certain warning.
   – The warning sign is blinking when a current warning is displayed, it is permanently lit for obsolete warnings.
   – To switch between warnings press the "up" and "down" button.
   – For further details see section *11.1.1 Warnings*.
2. Press "OK" to go to the next menu item.

5.2.4 Water price

1. Water price icon and current water price per litre are displayed:
   – Press "left" and "right" button to select a figure or decimal point.
   – Press "up" and "down" to change a figure or position of the decimal point.
2. Press "OK" to save the new value.
   – The new water price flashes three times to indicate successful change.
   – The next menu item opens automatically.

5.2.5 Water pressure

1. Water pressure icon and current inlet water pressure in bar are displayed,
2. Press "OK" to go to the next menu item.

5.2.6 Light test

1. All lights (icons, figures and buttons) are displayed.
2. Press "OK" to go to the next menu item. After 1 minute, the next menu item opens automatically.

5.2.7 Buttons test

1. One after the other, all buttons are lit:
   – Press the lit button to check the function and change to the next button, then press next button...
   – The order of appearance is: "water button", "download", "up", "right", "down", "left", "OK" button.
2. Service menu is restarted.
   – Press "OK" to go to the next menu item, or remove the ServiceCard.

5.3 Performance test

1. Place a canister with litre scale under the water outlet.
2. Place the ServiceCard on the left smart card reader,
   – 99999 and water credits is displayed in the left part of the big display.
   – The "water button" is lit.
3. Press "water button" to start water tapping.
   – Let the water flow until the AQtap is deaerated.
4. Press "water button" to stop tapping water.
5. Empty the canister and place it again under the water outlet.
6. Press "water button" to start water tapping.
   – Watch tapped amount of water being counted up in the left part of the big display until 10 l is displayed.
7. Press "water button" to stop water tapping.
8. Check if the tapped amount of water corresponds to the water in the canister. The tapped amount for the first 10 litres may differ by 1 litre.

6. Starting up the product

AQtap is ready for operation after commissioning with the ServiceCard.

7. Product introduction

TM06 4304 5015

Fig. 4 AQtap interfaces and components

Legend

Pos.	Description
1	Antenna
2	User interface
3	Condensate drain
4	Power in
5	Water outlet
6	Water inlet
7	Shut-off valve
8	Stainer
9	90° elbow
10	Galvanic separator

TM06 4306 5015
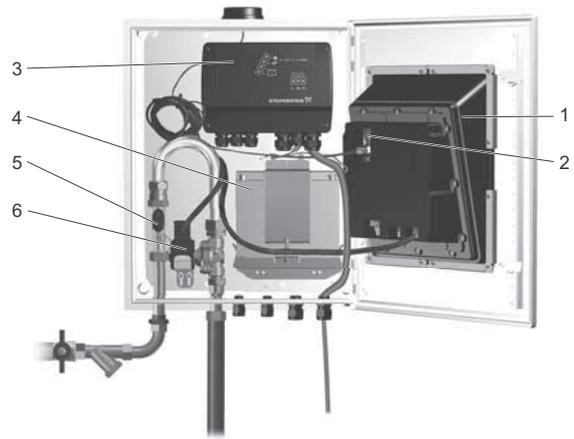
Fig. 5 AQtap inside components

Legend

Pos.	Description
1	Control unit
2	SIM card
3	Power supply unit
4	Battery
5	Flow sensor
6	Solenoid valve

7.1 Product description

AQtap

AQtap is an intelligent water dispenser that addresses some of the main challenges of providing a reliable and sustainable water supply in the developing world. Through an integrated platform for revenue collection and online management of water points, AQtap supports the financial viability and accountability of water service operation.

AQtap supports user friendly dispensing of drinking water to consumers through a simple and intuitive interface and system for credit transactions using smart cards.

Consumers load credits directly at the AQtap onto their WaterCards, either through local water credit vendors or via mobile credit platforms.

When tapping water, the water credits of the consumers' WaterCard are automatically deducted in a transparent way.

The water dispenser has a robust construction, it operates precisely and with minimum wastage of water. The AQtap can be operated with grid and / or solar power. The internal battery is used as a backup power for approximately 12 hours of operation.

aqTOP

aqTOP is a terminal for water credit distribution and smart card activation. aqTOP can be used as a supplement in large water kiosks and mini grid applications (multiple dispensers) to avoid that the credit distribution disturbs the water tapping.

Water Management System

The Water Management System (WMS) is an online platform that monitors and manages connected AQtap water dispensers.

Smart cards

Smart cards are required for all actions at the AQtap. Four user profiles are available for different actions.

7.1.1 Power supply

The AQtap can be operated with grid and / or solar power. It uses the power supply in the following hierarchy:

1. solar power
2. grid power
3. battery

Using solar power requires a connected battery. The internal battery is loaded when grid or solar power is available, and is used as backup power for approximately 12 hours of operation. After discharging the backup battery, tapping water will not be possible right away when power (solar radiation) is on again, until the battery is recharged. If the internal battery is not powerful enough, it can be substituted by an external battery with MPPT charger.

Note	The internal battery is a wear part. It can be worn out by discharging it too many times, if the external power supply is insufficient.

Note	Depending on the solar radiation and degree of AQtap utilization, the internal battery and charging with solar power can be insufficient. In cases where tapping is not possible after using the backup battery, an external battery with MPPT solar charger can be used.

See section *Power supply requirements*.

7.1.2 Water supply

The water supply must provide clean drinking water. See section *Water supply requirements*.

7.2 Applications

7.2.1 Intended use

*   The AQtap is intended for dispensing drinking water and handling the smart cards for various actions. The quality of the dispensed water must comply with the drinking water standards of the WHO.
*   The aqTOP is intended for handling the smart cards for various actions, it does not include the hydraulic part.
*   The AQtap / aqTOP interface is intended to be operated with fingers and smart cards only.
*   The smart cards are intended for handling water credits and accessing the AQtap functions according to the different rights of the smart card holders.

Observe the technical data specified in section *13. Technical data*.

7.2.2 Improper use

⚠	**DANGER** **POISONING** Improper use can lead to personal injury! The AQtap dispenser must be used with water complying with WHO drinking water standards. All parts and materials used in the hydraulic system must be suitable for drinking water appliances.

Caution	Improper use can lead to damage to the equipment! The AQtap dispenser must be used with water complying with WHO drinking water standards and the technical data. The AQtap interface must only be operated with smart cards and with fingers.

The operational safety of the product is only guaranteed, if it is used in accordance with section *7.2.1 Intended use*.

*   The AQtap must not be used for other media than drinking water.
*   The AQtap interface must not be operated or treated with any kind of tools or items.
*   The AQtap must not be used if it is damaged, after improper repair or after unauthorized modification.

Caution	Other applications or the operation of the AQtap in ambient and operating conditions, which are not approved, are considered improper and are not permitted. Grundfos accepts no liability for any personal injury or damage resulting from incorrect use.

7.3 Identification

7.3.1 Nameplate
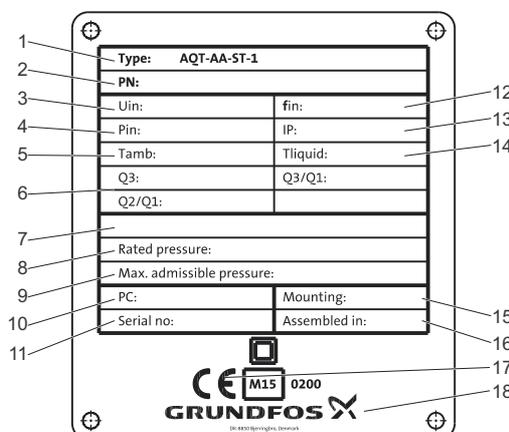
Fig. 6   Nameplate

Pos.	Description
1	Type (example), see *7.3.2 Type key*
2	Product number
3	Supply voltage, grid
4	Max. power consumption
5	Ambient temperature
6	For Q1 - Q4, see *AQtap standard flow meter parameters*
7	Supply voltage, solar panel
8	Pressure range for water supply
9	Max. pressure for water supply
10	Production date code (yyww)
11	Serial number
12	AC power supply frequency
13	Protection class of cabinet
14	Temperature range for water supply
15	Mounting orientation
16	State of origin (assembly)
17	CE mark (if applicable)
18	Manufacturer

7.3.2 Type key

Code	Example:	AQT	-AA	-ST	-1
AQT	**Product name** AQT				
AA AO	**Type** AQtap aqTOP				
ST	**Device** Standard				
1	**Version** Version 1				

7.4 AQtap safety concept

AQtap water dispensers are provided with a number of safety measures to avoid misuse by invalid smart cards or keys:

- Each AQtap is delivered with a pair of unique keys for the cabinet. Spare keys cannot be purchased. We recommend to keep one key as a master for copies in a safe place.
- The AQtap owner receives three smart cards that are preassigned to the proprietary WMS group: two AdminCards and one ServiceCard.
- All further smart cards must be ordered separately and activated at the AQtap.
- Smart cards can be used at all AQtaps within their group. Smart cards assigned to a group cannot be used within another group.
- AdminCards and ServiceCards are code-protected. The code must be set at the AQtap when the cards are used for the first time. The set code cannot be changed afterwards.
- All smart cards can be blocked permanently via WMS.

7.5 Overview of components and connections

The AQtap components are connected through different communication technologies making it possible to exchange data between the involved components.

All transactions between smart cards are carried out directly at the AQtap.
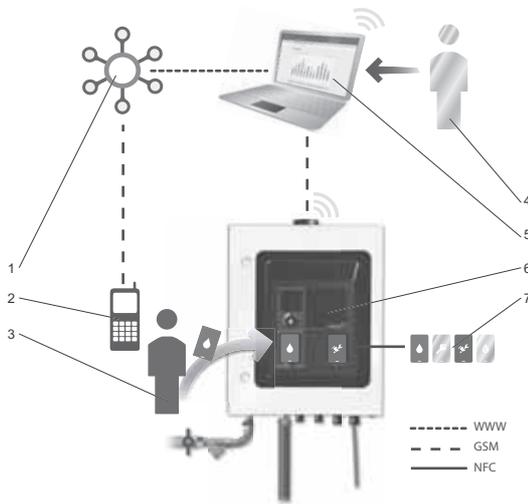
Fig. 7   AQtap component and connection overview

Pos.	Description
1	Mobile payment system (external)
2	Mobile phone
3	Smart card holder
4	Administrator
5	Water Management System (WMS)
6	AQtap water dispenser
7	Smart cards

Item	Connection
WWW	Internet
GSM	Global System for Mobile communications
NFC	Near Field Communication

7.6 Description of product function

7.6.1 AQtap / aqTOP

- Dispense water (not with aqTOP)
- Carry out all transactions with smart cards
- Send and receive data with WMS

7.6.2 WMS

- Manage AQtaps in groups
- Manage smart cards
- Monitor all actions at the AQtaps
- Create water credits
- Set water price

7.6.3 Smart cards and user profiles

AdminCard

AdminCard

The water service provider holding the AdminCard can:
- activate new VendorCards and ServiceCards
- create water credits on activated VendorCards

VendorCard

VendorCard

The water vendor holding the VendorCard can:
- activate new WaterCards
- download water credits from WMS
- transfer water credits to a WaterCard
- draw water from the AQtap for water credits

ServiceCard

ServiceCard

The service technician holding the ServiceCard can:
- run commisioning and set water price
- conduct a site acceptance test
- reset the AQtap

WaterCard

WaterCard

The water consumer holding the WaterCard can:
- draw water from the AQtap for water credits
- download water credits from WMS
- transfer water credits between WaterCards

7.7 AQtap user interface

The user interface consists of two displays, smart card readers, a "water button", and buttons that show up interactive.
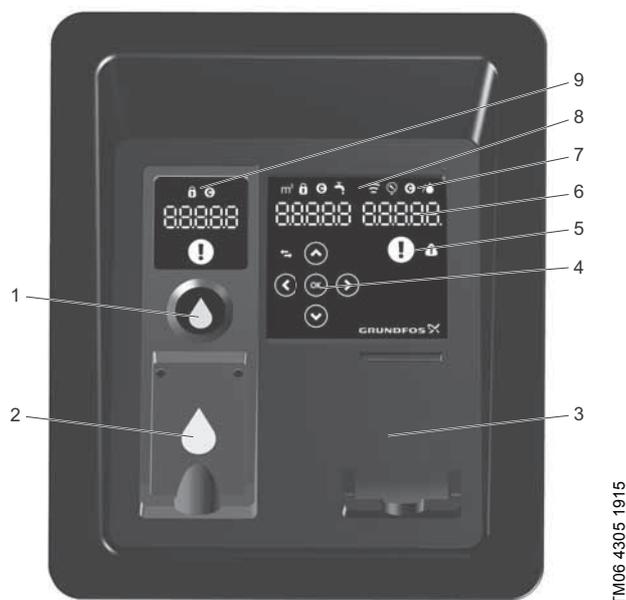

Fig. 8 AQtap user interface

Legend

Pos.	Description
1	Start/Stop "water button"
2	Smart card reader, left (e.g. water tapping)
3	Smart card reader, right (e.g. service menu)
4	Buttons (touch and sound)
5	Warning / alarm signalisation
6	Figures
7	Icons corresponding to the displayed value
8	Big display (right)
9	Small display (left)

Start/Stop "water button"

Icon	Name	Description
	"water button"	Press "water button" to start and stop water tapping

Smart card reader, left

Place the smart card on the left smart card reader to tap water, receive water credits from another smart card or download water credits from WMS.

Smart card reader, right

Place the smart card on the right smart card reader to run the service menu, send water credits to another smart card or activate a new smart card placed on the left smart card reader.

Buttons (touch and sound)

Icon	Name	Description
	"download" button	Download water credits from WMS
	"OK" button	Transfer water credits between smart cards, accept a value or go to next step
	"up" button	Make selection, or change a value upwards
	"down" button	Make selection, or change a value downwards
	"left" button	Choose left figure
	"right" button	Choose right figure

Warning / alarm signalisation

Icon	Name	Description
	Alarm (red)	• Signalisation of active alarms • AQtap water dispenser is out of operation • To check alarms, see section *11.1.2 Alarms*
	Warning (yellow)	• Signalisation of active warnings • AQtap water dispenser is operational • To check warnings, see section *11.1.1 Warnings*

Figures

Together with the corresponding icon, the figures show a certain value, for example water credits on the smart card, remaining water credits during tapping, tapped amount of water, inlet water pressure.

To set a value, select figure and decimal point with "left" and "right", and change them with "up" and "down".

Icons corresponding to value displayed

Icon	Name	Description
	Lock	AQtap locked, PIN code required
	Water credit	Water credits
	m3	Amount of water in m³
	Tap	Tapping possible or ongoing
	Connection	Data communication with WMS ongoing
	Gauge	Inlet water pressure
	per litre	(Water credits) per litre

7.8 Storage capacity of smart cards

The water credits are stored with four decimal digits on the smart card. The maximum amount of water credits that can be stored on a smart card is 420000.0000.

If a transfer or download of water credits leads to a value exceeding 420000.0000, the transfer or download is rejected completely.

7.9 Display of large amounts of water credits at the AQtap

The AQtap can only display the first five digits of a value.

The maximum amount of water credits that can be transferred between smart cards is therefore 99999, as no bigger value can be selected.

If more than 99999 water credits are stored on a smart card, only the first five digits will be displayed. The last digit is flashing to indicate that the amount of water credits is not displayed completely.

Example:

Water credits stored on the smart card	Displayed value at the AQtap, last digit flashing
249376	2493**7**
300000	3000**0**

7.10 Water Management System (WMS)

7.10.1 General

The Water Management System (WMS) is an online platform that monitors and manages connected AQtap water dispensers. See the WMS manual which you can find online in the help section of WMS. WMS offers access to:
• data on water consumption
• operational status and service logs
• reports on water credit transactions
• setting of water prices
• distribution of water credits.

7.10.2 WMS safety

Each owner of one or more AQtaps receives a proprietary WMS group with a unique ID. Each user has access to his group only.

7.10.3 Self-registration in GRUNDFOS LOGIN

New owners of AQtaps receive a welcome email with a link (URL) to WMS. To register as new user:
1. Click on the link to WMS.
   – The GRUNDFOS LOGIN page opens.
2. Create a new login by clicking on "Not registered yet?".
3. Enter the requested data:
   – email address as login name (same as for order),
   – password,
   – name.
4. Read and confirm "Privacy policy" and click on "Register".
   – A confirmation email for user profile validation is sent to the login email address.
5. Validate user profile by clicking on the link in the confirmation email.

The login for the WMS group is created.

7.10.4 Accessing the WMS

For access to WMS, internet connection is required.
1. Click on the WMS link in the welcome email.
2. Enter the login credentials:
   – email-address,
   – password.

WMS is now opened.

7.10.5 Operating of offline AQtaps

An AQtap water dispenser is fully operational, even if the connection to WMS cannot be established. If not connected to WMS, AQtaps cannot exchange data. All settings must be made directly at the AQtap water dispenser.

7.10.6 Setting up AQtap for online use

For exchange of data, the connection between AQtap and WMS must be established. The 2G GPRS communication must be set up, and the AQtap must be registered by the owner.

Setting up the GPRS communication

Install the SIM card in the AQtap, see section *4.7 SIM card preparation and installation*, and commission the AQtap using the ServiceCard, see section *5. Commissioning the product*.

Registering an AQtap in WMS

1. Go to Settings > Dispensers > Add new dispenser
2. Select cluster (optional). Enter name of AQtap (optional).
Enter serial number from AQtap nameplate.
3. Enter project name and project ID (optional).
4. Set water price: enter amount of water credits per litre of water.
5. Set location of AQtap: enter GPS longitude and latitude (optional).
6. Register SIM card: enter phone number with country code. Enter IMEI number from HMI unit inside AQtap cabinet door. Select telco operator.

7. When the AQtap is commissioned, it confirms the connection to WMS.
   – The confirmation process can take several hours, depending on the GSM network status on AQtap installation site.
   – The connection status of a registered AQtap can be found under Report > Status map.
   – The timestamp of the last connection can be found in the Dispenser settings.

8. Payment methods

Two payment methods to convert money to water credits on a smart card are possible: point of sale and mobile payment. All payment processes are monitored by WMS.

For more information on providing water credits via Water Management System (WMS), see the WMS manual which you can find online in the help section of WMS.

For more information on downloading the water credits to a VendorCard or a WaterCard, see section *9.2 Download water credits to a smart card*.

For more information on transferring water credits from a VendorCard to a WaterCard, see section *9.3 Transfer of water credits between smart cards*.

8.1 Point of sale / water vendor

Water vendors receive water credits on their VendorCards from an AdminCard, or via download from WMS directly at the AQtap. The water vendor can then transfer water credits to WaterCards and collect the money from the water consumers. The sales activities are monitored by WMS.

8.2 Mobile payment

The AQtap includes a mobile payment feature in collaboration with local mobile operators. The payment process between the requester of water credits (smart card holder), the mobile wallet provider and WMS is routed via a secure connection.

The smart card holder needs a mobile wallet account and uses his mobile bank interface to purchase water credits. As the mobile bank interfaces differ significantly, we will inform locally about the operational details.

When the mobile bank transaction is completed, the water credits are available for download directly at the AQtap.

8.2.1 Water credits purchase via mobile payment:

Note	The data of a newly activated smart card must be uploaded to WMS, before the smart card can be used for mobile payment. It can take several hours until AQtap and WMS have connected and the data is uploaded.

The smart card holder requests water credits from the mobile bank, giving information on:
• amount of water credits
• smart card number.

If the request succeeds, the mobile bank sends a notification of approved payment. Water credits are available at the AQtap.

If the request fails, the mobile bank sends a notification of rejected payment.

Reasons for a failed request can be:
• invalid request
• no money in the mobile wallet
• transaction limit reached, see section *7.8 Storage capacity of smart cards*
• unknown smart card (check if AQtap has been connected to WMS after first transaction)
• invalid smart card (blocked in WMS)
• wrong smart card number.

9. Operating the AQtap by means of the smart cards

Note
> If a transfer or download of water credits leads to a value exceeding 420000, the transfer or download is rejected completely.
>
> If a six-digit value of water credits is stored on a smart card, only the first five digits are displayed with the last digit flashing, to indicate that the amount of water credits is not displayed completely.

For information on the storing capacity of smart cards, and for information on display and transfer of large amounts of water credits at the AQtap, see sections *7.8 Storage capacity of smart cards* and *7.9 Display of large amounts of water credits at the AQtap*.

9.1 Water tapping for water credits

Drawing water from the AQtap for water credits is only possible with valid water credits on the smart card:

1. Place a canister under the water outlet.
2. Place the WaterCard or VendorCard on the left smart card reader.
   – The "water credits" icon and value are displayed in the small display.
   – The "water credits" / "litre of water" icons and value (water price per litre) are displayed in the big display.
3. Press the "water button" to start the water tapping.
   – The "tap" icon is displayed.
   – The amount of water tapped is displayed in the left part of the big display.
   – The remaining water credits are displayed in the small display.
   – For each new litre of water, the total price per litre is deducted from the smart card.
4. Press the "water button" to stop the water tapping.
   – After stopping the water tapping with the "water button", unused water credits of the last partially tapped litre are written back to the smart card.
   – The water credits for the min. tapping volume = 0.4 litres are always deducted.
   – If you stop the tapping by removing the smart card, unused water credits are not written back to the smart card.

9.2 Download water credits to a smart card

Water credits are provided for smart cards in WMS directly by the administrator or via mobile payment. Then they are available at the AQtap for download to the assigned smart card.

9.2.1 Creating water credits for a smart card through mobile banking system

1. Make a transaction through your mobile bank with the business number provided by the owner of the AQtap and the number of your WaterCard.
2. Your mobile banking company will confirm the transaction.
3. Check if the water credits are available for download, see section *9.2.3 Downloading water credits to a smart card*.

9.2.2 Creating water credits for a smart card directly in WMS

Assign water credits to a smart card in the "Credits Menu" in WMS. For more information, see the manual which you can find online in the help section of WMS.

9.2.3 Downloading water credits to a smart card

Note
> If there is no connection, try again later!

1. Place the smart card in the left smart card reader.
   – The small display shows the water credits on the smart card.
2. Press the "download" button.
   – If the AQtap is connected to WMS, the assigned water credits available for download are displayed in the left part of the big display.
3. Press the "OK" button.
   – The water credits are counted down in the big display and counted up in the small display until the download is completed.

9.3 Transfer of water credits between smart cards

9.3.1 Notes for water vendors

- Request water credits from the water service provider before the VendorCard runs out of water credits.
- Only charge the money for the amount you are transferring. Water consumers are instructed not to pay a transaction fee.
- Your VendorCard can only be used at AQtaps that have been assigned by the administrator.

9.3.2 Transferring water credits between VendorCard and WaterCard or between WaterCards

1. Place the receiving WaterCard in the left smart card reader and the VendorCard or WaterCard from which water credits are to be transferred in the right smart card reader.
   – The "water credits" icon and value are displayed in the small and in the big display.
2. Select the amount of water credits to be transferred with the "up" and "down" buttons.
   – The value is displayed in the left part of the big display.
   – The increments are depending on the water price.
3. Press the "OK" button.
   – The water credits are counted down in the big display and counted up in the small display until the transfer is completed.

9.3.3 Transferring water credits from an AdminCard to a VendorCard or WaterCard

1. Place the receiving smart card in the left smart card reader and the AdminCard in the right smart card reader.
2. Enter the PIN code of the AdminCard.
   – The "water credits" icon and value are displayed in the small display.
   – The AdminCard shows "99999" (unlimited water credits).
3. Select the amount of water credits to be transferred with the "up" and "down" buttons.
   – The value is displayed in the left part of the big display.
   – The increments are depending on the water price.
4. Press the "OK" button.
   – The water credits are counted down in the big display and counted up in the small display until the transfer is completed.

9.4 Activating new smart cards

All actions at the AQtap require activated smart cards. New VendorCards or ServiceCards must be activated with the AdminCard, new WaterCards must be activated with a VendorCard. To activate a smart card:

1. Place the activated smart card on the right card reader of the commissioned AQtap.
   – For an AdminCard enter the code.
2. Place the new smart card on the left card reader.
3. Press the "left" button.
4. Press "OK".
   – Four flashes show that the new smart card is activated.

9.5 Set or change water price

The water price can be set or changed in the service menu of the AQtap with the ServiceCard. To set or change the water price in the service menu see sections *5.2 Service menu*, *5.2.4 Water price*

10. Servicing the product

DANGER

ELECTRIC SHOCK

If the electrical mains connection is damaged, it must be replaced by Grundfos, a Grundfos service partner or a similarly qualified specialist, in order to avoid a hazard.

All servicing work must be carried out by authorised and qualified staff.

Shut down the whole system before any work at the system components and lines!

Switch off the power supply, both grid and solar, before carrying out servicing work or opening the cabinet.

Safety installations, which have been disabled during servicing, must be enabled again immediately after servicing.

10.1 Maintaining the product

10.1.1 Maintenance requirements

To maintain the AQtap water dispenser, the service menu must be run and the cabinet must be opened. Requirements for maintenance are:

• ServiceCard

• 1 unique key and 1 standard cabinet key

• torque wrench

• adjustable spanner

10.1.2 Maintenance schedule

All steps to be carried out for maintenance are described in the following sections *10.1.3 Check the service situation*, *10.1.4 Check the outside of the AQtap cabinet*, *10.1.5 Check the inside of the AQtap cabinet* and *10.1.6 Cleaning tank and strainer*.

• Maintain the AQtap according to these instructions:
  – At least every 6 months.
  – The strainer must be cleaned more often. If the water contains particles, adjust the cleaning schedule accordingly.
  – In the event of a fault.

• Replace the internal battery if it is worn out.

• If defective parts are detected, have the AQtap serviced by a Grundfos SSP (sales and service partner).
  – For available spare parts, see section *13.4 AQtap spare parts (service kits)*

• The solenoid valve should be cleaned by a Grundfos SSP:
  – At least every 12 months.
  – In the event of a fault.

10.1.3 Check the service situation

• Carry out a SAT (site acceptance test) by means of the service menu / ServiceCard, see section *5.2 Service menu*.

• In case of displayed alarms or warnings carry out a restart, see section *11.2 Restarting the AQtap* and repeat the SAT.

• Carry out a performance test, see section *5.3 Performance test*.

• Check that the solenoid valve closes/opens easily, and does not drip.
  – Start/stop tapping water and check that the water outlet is not dripping.

10.1.4 Check the outside of the AQtap cabinet

• Make a general and visual inspection of the dispenser's good condition.

• Verify that power and other external cables are in good condition and not damaged.

• Verify that the locks are operable and that the dispenser cannot be opened without the keys.

• Verify that the cable glands are closed tightly.

10.1.5 Check the inside of the AQtap cabinet

• If a battery is connected, make sure that the wires and connections are in a good condition and the poles are not corroded.

• Verify that the fastening of the dispenser is not loose.

• Verify the good condition of the antenna and the related cable and the tightness of the installation. (Max. 5 Nm)

• Verify the good condition of the power cable and other external cables.

• Make sure that the cable glands are closed tightly.

• Close the cabinet and lock it with the keys.

10.1.6 Cleaning tank and strainer

• If a tank is used for water supply, empty and clean the tank in order to avoid sediment entering the AQtap.

• Clean the strainer filter to make sure that the water can flow without difficulties:

1. Close the shut-off valve.
2. Unscrew and remove the end cap from the strainer.
3. Take out the filter and clean it from particles.
4. Reinstall the filter.
5. Screw the end cap onto the strainer.
6. Open the shut-off valve.
7. Tap an amount of water until the AQtap is deaerated.
8. Check that the connections are tight.
   – Torque:
   – Strainer: 30 ±3Nm
   – Plastic fitting: 10 ±1Nm

10.2 Replacing the battery

| Caution | The battery in the kit is supplied charged. As soon as it is connected there is power on the AQtap. |

| Caution | Do not short-circuit the two poles of the batteries. |

| Note | If you connect a discharged battery, it can take up to 12 hours until the AQtap can be operated, even if it is connected to power supply. |

| Note | The waste battery must be disposed of according to local regulations! |

1. Close the shut-off valve.
2. Switch off the power supply, both grid and solar.
3. Open the cabinet.
4. Disconnect the battery at both poles.
5. Unscrew and remove the screw in the battery clamp.
6. Lift and remove the battery clamp.
7. Take out the old battery and dispose of it according to local regulations, see section *14. Disposing of the product*.
8. Place the new battery with the minus (-) pole on the left side.
9. Mount the battery clamp and fix it with the screw.
10. Connect the red cable to the plus (+) pole on the right side.
11. Connect the blue cable to the minus (-) pole on the left side.
12. Close the cabinet and lock it with the keys.
13. Open the shut-off valve.
14. Switch on the power supply.

10.3 Replacing the SIM card

	Switch off the power supply, both grid and solar, and disconnect the battery before replacing the SIM card. The SIM card will not be read by the AQtap until it was powered off and on again.
Caution	

	Disable the PIN protection of the SIM card. PIN protected SIM cards lead to malfunction.
Caution	

10.3.1 Preparing the new SIM card

1. Insert the SIM card into a mobile phone, and set the "PIN code request" option to "OFF".
2. Write down the following:
   – Mobile phone number of the SIM card.

10.3.2 Replacing the SIM card

1. Close the shut-off valve.
2. Switch off the power supply, both grid and solar.
3. Open the cabinet.
4. Disconnect the blue battery cable at the minus (-) pole on the left side.
5. Take out the SIM card.
6. Insert the new SIM card into the CIM.
   – Place the SIM card in the mould of the slide.
   – Slide the SIM card into the slot.
7. Connect the blue cable to the minus (-) pole on the left side.
8. Close the cabinet and lock it with the keys.
9. Open the shut-off valve.
10. Switch on the power supply.

10.3.3 Updating the AQtap settings in WMS

1. Go to Settings > Dispensers
2. Select the AQtap.
3. Update SIM card: enter phone number with country code. Select telco operator.
4. Save the settings.
   – The updating process can take up to several hours, depending on the GSM network status on AQtap installation site.

11. Fault finding

If the AQtap does not operate properly:

1. Carry out maintenance, see section *10.1 Maintaining the product*.
2. Check for displayed warning or alarm codes by means of the service menu / ServiceCard.
3. Restart the AQtap, see section *11.2 Restarting the AQtap*.

If the AQtap still does not operate properly, have the AQtap serviced by a Grundfos SSP (sales and service partner).

11.1 Warning and alarm codes

11.1.1 Warnings

Code	Name	Description
015	External communication fault	No data has been sent to WMS within 48 hours
025	Site acceptance test not completed	Site acceptance test (SAT) was interrupted
036	Valve leakage	Solenoid valve is closed, but flow is detected
058	Water flow too low	Solenoid valve is open, but flow is too low
084	Memory fault	SD card error
157	Time fault	Real time clock out of order
159	CIM modem fault	CIM 270 error

11.1.2 Alarms

Code	Name	Description
040*	Battery low	Battery is discharged or being charged
059	No flow	Solenoid valve is open, but no water is dispensed
074	Internal supply voltage too high	Internal power supply voltage is too high
075	Internal supply voltage too low	Internal power supply voltage is too low
088	Sensor fault	Flow sensor error
154	Display fault	Internal error on the HMI board
161	Flow sensor supply fault	Sensor supply voltage too low
210	Pressure too high	Water pressure is too high (> 4 bar)
211	Pressure too low	Water pressure is too low (< 0.1 bar)

* When solar radiation is back again, recharging of the battery starts and code 040 is displayed. It takes approximately 15 minutes with code 040 continuously displayed, until the battery is recharged over a certain voltage. The AQtap restarts automatically and is operable again.
If this happens more often, an external battery with MPPT solar charger can be used.

11.2 Restarting the AQtap

11.2.1 Entering the service menu

1. Place the ServiceCard on the right smart card reader.
2. Enter PIN code.
3. Press "OK" to go to the next menu item.

11.2.2 Alarms

1. Alarm sign (red) is displayed.
   – "download" button is not displayed.
2. Press "download" button and keep it pressed for approximately 20 sec.
   – "download" button is displayed, as long as it is pressed.
3. Display flashes to confirm successful restart of the AQtap.
   – AQtap is idle for a short time.
4. Enter PIN code again to continue, or remove ServiceCard.

12. Taking the product out of operation

12.1 Resetting the product

Resetting the AQtap removes it from its WMS group. WMS still tries to receive data from the AQtap and creates alarms until the IMEI no. and telephone no. are removed from the AQtap water dispenser in WMS. The logged data are kept.

• A new AQtap can be commissioned and replace the reset AQtap in WMS.
• The reset AQtap can be commissioned again in another WMS group with the assigned smart card.

12.1.1 Entering the service menu

1. Place the ServiceCard on the right smart card reader.
2. Enter PIN code.
3. Press "OK" to go to the next menu item.

12.1.2 Alarms

1. Alarm sign (red) is displayed.
2. Press "OK" to go to the next menu item.

12.1.3 Warnings

1. Warning sign (yellow) is displayed,
   – "download" button is not displayed.
2. Press "download" button and keep it pressed for approximately 20 sec.
   – "download" button is displayed, as long as it is pressed.
3. Display flashes to confirm successful reset of the AQtap,
   – AQtap is idle for a short time.
4. Remove ServiceCard.

Note	Do not enter the PIN code at this point, otherwise the reset fails and the AQtap is commissioned again.

12.2 Taking the product out of operation

1. Close the shut-off valve.
2. Disconnect the AQtap from the power supply, both grid and solar.
3. Open the cabinet.
4. Disconnect the blue battery cable from the minus (-) pole (left side of the battery). Place it securely so it cannot touch the battery poles during transportation.
5. Disconnect the water inlet.
6. Unscrew the fastening screws and take the AQtap off the wall.
7. For storage and transportation see section *3.1 Transporting the product*.

12.3 Preparing the product for disposal

Note	The waste batteries must be disposed of according to local regulations!

1. Close the shut-off valve.
2. Disconnect the AQtap from the power supply, both grid and solar.
3. Open the cabinet.
4. Disconnect the battery at both poles.
5. Unscrew and remove the screw of the battery clamp.
6. Lift and remove the battery clamp.
7. Take out the battery.
8. Disconnect the water inlet.
9. Unscrew the fastening screws and take the AQtap off the wall.
10. Open the control unit at the back and take out the battery.
11. Dispose of both batteries according to local regulations,
12. Dispose of the AQtap, see section *14. Disposing of the product*.

13. Technical data

Caution	The values stated in the technical data must be adhered to.

Technical data of water dispenser

Max. hydraulic capacity	~ 2 m^3/h
Hydraulic capacity under normal operation conditions	~ 1 m^3/h
Min. tapping volume	0.4 l
Accuracy	• 5% for 0.16 m^3/h to < 0.25 m^3/h • 2% for 0.25 m^3/h to 2 m^3/h • ± 1 litre for 0-10 litre per tapping
Dimensions of inlet and outlet connections	• 1/2" external thread directly at the AQtap • to be installed with 3/4" accessories and water supply
Weight	23 kg
Dimensions	400 x 500 x 210 mm
Protection class	IP45
Capacity of included backup-battery	12 V, 18 Ah = approx. 12 hours of operation
Battery extensibility	12 V external battery and MPPT charger can be connected
Reading angles of display	-/+ 60 degree
User interface	touch and sound
Direct flow sensor	• no metering of air pockets • no mechanical wear parts • pressure metering feature, pressure range 0-4 bar
Strainer pore size	0.5 mm
Valve type	solenoid valve with NC contact
Galvanic separator	plastic double nipple, 1/2" internal thread (female) 3/4" external thread (male)

AQtap standard flow meter parameters

Minimum flowrate	Q1 = 0.16 m^3/h
Transitional flowrate, between permanent and minimum flowrate	Q2 = 0.25 m^3/h
Permanent flowrate, highest flowrate under steady flow conditions	Q3 = 1.60 m^3/h
Overload flowrate, highest flowrate for a short period	Q4 = 2 m^3/h

Batteries

The batteries comply with the battery directive (2006/66/EC).

The non-rechargeable lithium battery included in the AQtap control unit does not contain mercury, lead and cadmium.

Battery type	CR2032 lithium battery, 3 V, 230 mAh

Internal (standby) battery

The rechargeable nonspillable AGM lead-acid battery included in the AQtap as a backup battery contains lead, it does not contain mercury and cadmium.

Voltage supply	battery 12 V, 18 Ah
Charging current	max. 4.5 A
Orientation of the battery with regards to polarity	left pole: minus (-) pole, blue cable right pole: plus (+) pole, red cable
AGM battery	filled with absorbing glass fibre mats, so no liquid can leak out

Water Management System and connectivity

Broadcasting of alarms/ warnings	setup in Water Management System
Data upload	min. every 24 hours
Data import from unconnected dispensers	via associated PC Tool
Smart card connectivity	NFC
Dispenser connectivity	GSM Quad-band and GR PS coverage
Required signal strength of mobile network	RSSI > 18 (-77 dBm)
Connectivity setup	1. install SIM card in power-off AQtap 2. enter associated phone number, IMEI number and select telco operator in Water Management System The unit is functional without connectivity.
Mobile subscription specification	• mini-SIM card (15 x 25 mm) • 2G machine-to-machine GPRS data subscription • ability to send and receive international SMS messages • ability to acquire a signal from the network operator you expect it to use • GPRS data subscription of 10 MB per month with automatic top-up
Connectivity extensibility	external antenna can be connected
Water Management System browser support	• Explorer: version 9 or newer • Firefox: version 10 or newer • Chrome: version 17 or newer • Safari: version 6 or newer • Opera: version 10 or newer

Ambient condition requirements

Ambient temperature	1-50 °C
Max. relative humidity	95 % (non-condensing)
Mounting	designed for wall-mounting, protected from direct sunlight and rain

Water supply requirements

Water quality	complying with WHO drinking water standards
Water pH	5-9
Water particle content	particle size max. 0.5 mm • always install with supplied strainer
Water temperature	0.1 - 40 °C
Inlet pressure range	0.02 - 0.4 MPa (0.2 - 4 bar) (height of main tank outlet: > 3 m)

Power supply requirements

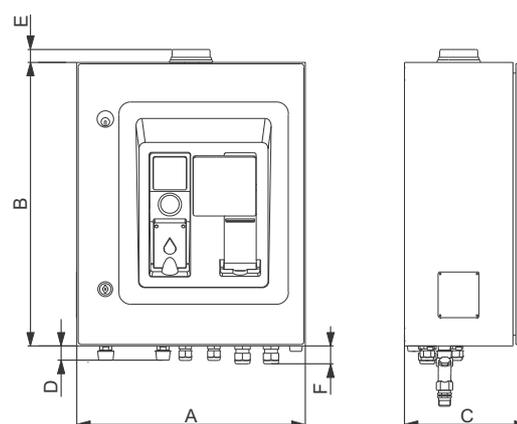| Power supply	• grid power AC connection: 110 - 240 V, 50/60 Hz • solar panel DC voltage: 15 - 45 V / 3 A
Max. power consumption	45 W (1 solar panel is enough)

13.1 Dimensions

Fig. 9 Dimensional sketch of AQtap

A [mm]	B [mm]	C [mm]	D [mm]	E [mm]	F [mm]
400	500	210	25	23	31.6

13.2 Part numbers

Product	Product No.
AQtap dispenser	98794194
aqTOP terminal	98985423
Starter package, comprising 2 activated AdminCards and 1 activated ServiceCard	98893521
ServiceCard (2 pcs)	98893522
ServiceCard (10 pcs)	98893523
VendorCard (2 pcs)	98893524
VendorCard (10 pcs)	98893525
WaterCard (10 pcs)	98893526
WaterCard (100 pcs)	98893527
Mountection frame	98893528
Shut-off valve	98893529
Pressure reducing valve	98893530
GF 100 S solar panel	98614404
Wire kit - solar panel to dispenser	98257868
Solar package cabinet	99009500
Solar package kit	99009524
Antenna, complete, GSM/GRM, with 15m cable	98518346
PC Tool Link	96705378
Service suitcase	98915003

13.3 Smart card ID numbering ranges

Smart card	ID
AdminCard	5000 - 9999
ServiceCard	10000 - 14999
VendorCard	15000 - 29999
WaterCard	from 30000

13.4 AQtap spare parts (service kits)

Description	Product No.
Control unit kit, comprising: complete control unit, cables, screws	98795791
Power supply kit, comprising: complete power supply unit, screws	98795792
Flow sensor kit, comprising: flow sensor, O-rings, clips, cable	98795793
Valve kit, complete, comprising: solenoid valve, unions, PTFE tape, flow restrictor	98795794
Cable kit, comprising: power plug and cables for battery, flow sensor, valve, HMI, relay	98795796
Power plug kit, comprising: grid power plug	98795797
Battery kit, comprising: battery	98795798
Antenna kit, comprising: complete antenna with 4 m of cable and plug	96095288
Hydraulic kit, comprising: complete hydraulic part, gaskets	98795799
Strainer kit, comprising: strainer, galvanic separator (plastic double nipple), PTFE tape	98860850
Flow restrictor kit, comprising: Flow restrictor, gasket	98985446

14. Disposing of the product

This product or parts of it must be disposed of in an environmentally sound way:

The batteries must be removed before the product is disposed of, see section *12.2 Taking the product out of operation*. The waste batteries should be disposed of through the national collective schemes. If in doubt, contact your local Grundfos company.

Use appropriate waste collection services. If this is not possible, contact the nearest Grundfos company or service workshop.

This product complies with directive 2006/66/EU and contains batteries which should not be disposed of with other household waste, but must be collected separately.

Subject to alterations.

Denmark
GRUNDFOS LIFELINK A/S
Poul Due Jensens Vej 7
DK-8850 Bjerringbro
Tlf.: +45-87 50 14 00
www.grundfos.com

Argentina
Bombas GRUNDFOS de Argentina S.A.
Ruta Panamericana km. 37.500 Centro
Industrial Garin
1619 Garín Pcia. de B.A.
Phone: +54-3327 414 444
Telefax: +54-3327 45 3190

Australia
GRUNDFOS Pumps Pty. Ltd.
P.O. Box 2040
Regency Park
South Australia 5942
Phone: +61-8-8461-4611
Telefax: +61-8-8340 0155

Austria
GRUNDFOS Pumpen Vertrieb Ges.m.b.H.
Grundfosstraße 2
A-5082 Grödig/Salzburg
Tel.: +43-6246-883-0
Telefax: +43-6246-883-30

Belgium
N.V. GRUNDFOS Bellux S.A.
Boomsesteenweg 81-83
B-2630 Aartselaar
Tél.: +32-3-870 7300
Télécopie: +32-3-870 7301

Brazil
BOMBAS GRUNDFOS DO BRASIL
Av. Humberto de Alencar Castelo Branco,
630
CEP 09850 - 300
São Bernardo do Campo - SP
Phone: +55-11 4393 5533
Telefax: +55-11 4343 5015

Canada
GRUNDFOS Canada Inc.
2941 Brighton Road
Oakville, Ontario
L6H 6C9
Phone: +1-905 829 9533
Telefax: +1-905 829 9512

China
GRUNDFOS Pumps (Shanghai) Co. Ltd.
10F The Hub, No. 33 Suhong Road
Minhang District
Shanghai 201106
PRC
Phone: +86 21 612 252 22
Telefax: +86 21 612 253 33

Denmark
GRUNDFOS DK A/S
Martin Bachs Vej 3
DK-8850 Bjerringbro
Tlf.: +45-87 50 50 50
Telefax: +45-87 50 51 51
E-mail: info_GDK@grundfos.com
www.grundfos.com/DK

Finland
OY GRUNDFOS Pumput AB
Mestarintie 11
FIN-01730 Vantaa
Phone: +358-(0)207 889 500
Telefax: +358-(0)207 889 550

France
Pompes GRUNDFOS Distribution S.A.
Parc d'Activités de Chesnes
57, rue de Malacombe
F-38290 St. Quentin Fallavier (Lyon)
Tél.: +33-4 74 82 15 15
Télécopie: +33-4 74 94 10 51

Germany
GRUNDFOS GMBH
Schlüterstr. 33
40699 Erkrath
Tel.: +49-(0) 211 929 69-0
Telefax: +49-(0) 211 929 69-3799
e-mail: infoservice@grundfos.de
Service in Deutschland:
e-mail: kundendienst@grundfos.de

Greece
GRUNDFOS Hellas A.E.B.E.
20th km. Athinon-Markopoulou Av.
P.O. Box 71
GR-19002 Peania
Phone: +0030-210-66 83 400
Telefax: +0030-210-66 46 273

Hong Kong
GRUNDFOS Pumps (Hong Kong) Ltd.
Unit 1, Ground floor
Siu Wai Industrial Centre
29-33 Wing Hong Street &
68 King Lam Street, Cheung Sha Wan
Kowloon
Phone: +852-27861706 / 27861741
Telefax: +852-27858664

India
GRUNDFOS Pumps India Private Limited
118 Old Mahabalipuram Road
Thoraipakkam
Chennai 600 096
Phone: +91-44 2496 6800

Indonesia
PT. GRUNDFOS POMPA
Graha Intirub Lt. 2 & 3
Jln. Cililitan Besar No.454. Makasar,
Jakarta Timur
ID-Jakarta 13650
Phone: +62 21-469-51900
Telefax: +62 21-460 6910 / 460 6901

Ireland
GRUNDFOS (Ireland) Ltd.
Unit A, Merrywell Business Park
Ballymount Road Lower
Dublin 12
Phone: +353-1-4089 800
Telefax: +353-1-4089 830

Italy
GRUNDFOS Pompe Italia S.r.l.
Via Gran Sasso 4
I-20060 Truccazzano (Milano)
Tel.: +39-02-95838112
Telefax: +39-02-95309290 / 95838461

Japan
GRUNDFOS Pumps K.K.
Gotanda Metalion Bldg., 5F,
5-21-15, Higashi-gotanda
Shiagawa-ku, Tokyo
141-0022 Japan
Phone: +81 35 448 1391
Telefax: +81 35 448 9619

Korea
GRUNDFOS Pumps Korea Ltd.
6th Floor, Aju Building 679-5
Yeoksam-dong, Kangnam-ku, 135-916
Seoul, Korea
Phone: +82-2-5317 600
Telefax: +82-2-5633 725

Malaysia
GRUNDFOS Pumps Sdn. Bhd.
7 Jalan Peguam U1/25
Glenmarie Industrial Park
40150 Shah Alam
Selangor
Phone: +60-3-5569 2922
Telefax: +60-3-5569 2866

Mexico
Bombas GRUNDFOS de México S.A. de
C.V.
Boulevard TLC No. 15
Parque Industrial Stiva Aeropuerto
Apodaca, N.L. 66600
Phone: +52-81-8144 4000
Telefax: +52-81-8144 4010

Netherlands
GRUNDFOS Netherlands
Veluwezoom 35
1326 AE Almere
Postbus 22015
1302 CA ALMERE
Tel.: +31-88-478 6336
Telefax: +31-88-478 6332
E-mail: info_gnl@grundfos.com

New Zealand
GRUNDFOS Pumps NZ Ltd.
17 Beatrice Tinsley Crescent
North Harbour Industrial Estate
Albany, Auckland
Phone: +64-9-415 3240
Telefax: +64-9-415 3250

Norway
GRUNDFOS Pumper A/S
Strømsveien 344
Postboks 235, Leirdal
N-1011 Oslo
Tlf.: +47-22 90 47 00
Telefax: +47-22 32 21 50

Poland
GRUNDFOS Pompy Sp. z o.o.
ul. Klonowa 23
Baranowo k. Poznania
PL-62-081 Przeźmierowo
Tel: (+48-61) 650 13 00
Fax: (+48-61) 650 13 50

Portugal
Bombas GRUNDFOS Portugal, S.A.
Rua Calvet de Magalhães, 241
Apartado 1079
P-2770-153 Paço de Arcos
Tel.: +351-21-440 76 00
Telefax: +351-21-440 76 90

Russia
ООО Грундфос Россия
109544, г. Москва, ул. Школьная, 39-41,
стр. 1
Тел. (+7) 495 564-88-00 (495) 737-30-00
Факс (+7) 495 564 88 11
E-mail grundfos.moscow@grundfos.com

Singapore
GRUNDFOS (Singapore) Pte. Ltd.
25 Jalan Tukang
Singapore 619264
Phone: +65-6681 9688
Telefax: +65-6681 9689

South Africa
GRUNDFOS (PTY) LTD
Corner Mountjoy and George Allen Roads
Wilbart Ext. 2
Bedfordview 2008
Phone: (+27) 11 579 4800
Fax: (+27) 11 455 6066
E-mail: lsmart@grundfos.com

Spain
Bombas GRUNDFOS España S.A.
Camino de la Fuentecilla, s/n
E-28110 Algete (Madrid)
Tel.: +34-91-848 8800
Telefax: +34-91-628 0465

Sweden
GRUNDFOS AB
Box 333 (Lunnagårdsgatan 6)
431 24 Mölndal
Tel.: +46 31 332 23 000
Telefax: +46 31 331 94 60

Switzerland
GRUNDFOS Pumpen AG
Bruggacherstrasse 10
CH-8117 Fällanden/ZH
Tel.: +41-44-806 8111
Telefax: +41-44-806 8115

Taiwan
GRUNDFOS Pumps (Taiwan) Ltd.
7 Floor, 219 Min-Chuan Road
Taichung, Taiwan, R.O.C.
Phone: +886-4-2305 0868
Telefax: +886-4-2305 0878

Thailand
GRUNDFOS (Thailand) Ltd.
92 Chaloem Phrakiat Rama 9 Road,
Dokmai, Pravej, Bangkok 10250
Phone: +66-2-725 8999
Telefax: +66-2-725 8998

Turkey
GRUNDFOS POMPA San. ve Tic. Ltd. Sti.
Gebze Organize Sanayi Bölgesi
Ihsan dede Caddesi,
2. yol 200. Sokak No. 204
41490 Gebze/ Kocaeli
Phone: +90 - 262-679 7979
Telefax: +90 - 262-679 7905
E-mail: satis@grundfos.com

United Arab Emirates
GRUNDFOS Gulf Distribution
P.O. Box 16768
Jebel Ali Free Zone
Dubai
Phone: +971 4 8815 166
Telefax: +971 4 8815 136

United Kingdom
GRUNDFOS Pumps Ltd.
Grovebury Road
Leighton Buzzard/Beds. LU7 4TL
Phone: +44-1525-850000
Telefax: +44-1525-850011

U.S.A.
GRUNDFOS Pumps Corporation
17100 West 118th Terrace
Olathe, Kansas 66061
Phone: +1-913-227-3400
Telefax: +1-913-227-3500

Uzbekistan
Grundfos Tashkent, Uzbekistan The Repre-
sentative Office of Grundfos Kazakhstan in
Uzbekistan
38a, Oybek street, Tashkent
Телефон: (+998) 71 150 3290 / 71 150
3291
Факс: (+998) 71 150 3292

Addresses Revised 28.09.2015

be think innovate

Date of installation:
Name of installer:
SIMcard telephone company:
SIMcard phone no.:
Contact information of service technician:

www.grundfos.com

GRUNDFOS