Water

Installation and Operating Instructions

GWF water meters Unico2e, MTK3e & MTW3e - NTEP - 915 MHz

1. Safety instructions

1. Care must be taken when installing or removing the meter to avoid electrical shock where water pipelines may serve as earthing for electrical systems. Depending on actual application an electrical bypass of the water meter is to be ensured. The local and national electrical instructions are to be considered. GWF shall not be liable for improper water meter bridging.
2. To avoid the meter being damaged due to frozen water, the installation should be insulated to protect the meter and the surrounding pipework and fittings from freezing conditions. GWF assumes no liability for damage caused.
3. Measures should be taken, so that the water meter is not damaged by hydraulic influences such as, water hammer and cavitations.
4. During commissioning and after every time the water meter has run dry, shut-off valves must be opened slowly in order to avoid pressure shocks on the water meter.

The water meters may only be used for the intended purpose. The manual serves as a guide for correct installation and operation, and failure to follow these instructions releases GWF from any liabilities. The responsibility for the correct installation as well as professional handling falls within the scope and receipt of goods on the owner or operator.

2. Field of application

Model		Unico2e	MTK3e		MTW3e	
Nominal pipe size		¾"	1"	1.5"	1"	1.5"
Connection on meter (thread)	NPSM	1"	1¼"	2"	1¼"	2"
Max. flow rate	gpm	22	55	88	55	88
Max. continuous flow rate	gpm	11	44	70	44	70
Min. flow rate	gpm	0.50	0.75	1.50	0.75	1.50
Max. working pressure	psi	230	230	230	230	230
Max. medium temperature	°F	194	122	122	194	194
Ambient temperature	°F	+41...+131				
Transport & Storage temperature	°F	-4...+158				
Operating temperature (Display and Electronic)	°F	+41...+140				
Register		Electronic register ERH				
Interface		LoRaWAN, US902-928 MHz				
NTEP approval No.		CC 19-019A2	CC 21-096A1			

GWF water meters are designed for use with potable water supplies for residential buildings to measure low to middle flowrates. This instruction contains all important information and instructions for the installation and operation of the above mentioned water meters. Installation, connection and maintenance must only be carried out by expert technicians who have read and understood the operating instructions. The user acknowledges and accepts that GWF shall not be responsible for any damages, injuries or losses incurred due to improper installation or operation that does not align with the instructions provided in the manual.

3. Packaging content

1 water meter, 2 gaskets, 1 installation and operating instruction (Number of installation and operating instruction depends on packaging unit).

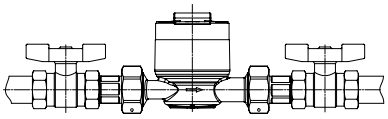
4. Sizing of the water meter

GWF water meters are to be sized according to the relevant ratings. A continuous overload will lead to the water meter being damaged. The maximum flow rate may only take place at a maximum of 1 hour per day and over the life span of the water meter a maximum of 100 hours summed together. When specifying the water meter the operating conditions occurring in the application are to be considered. In particular these are:

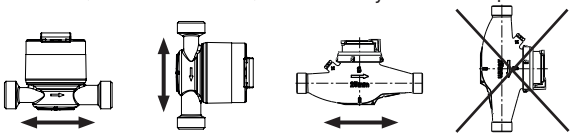
- Max. continuous flow rate, Max. working pressure
- Max. medium, operating and ambient temperature
- Installation position

5. Installation instructions

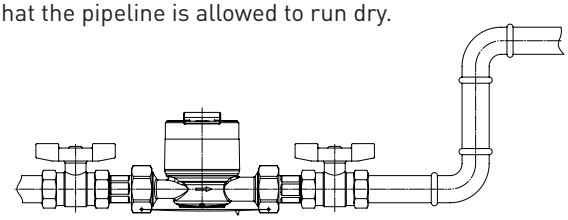
1. The installation must not expose the water meter to direct sunlight.
2. The water meter should be installed in a frost-free environment, which allows access for reading, maintenance and inspection.
   We recommend a minimum distance of 8 Inch from the face of the register. In all other directions of the meter we recommend a minimum distance of 4 Inch.
3. Metallic surfaces directly around the water meter as well as external cables, which are wrapped around the water meter, interfere with the radio signal and are therefore must be avoided.
4. It is recommended to install shut-off valves upstream and downstream of the water meter, to facilitate the installation and removal of the water meter for periodic inspection and maintenance work.



5. Singlejet meters (Unico2e) can be installed in horizontal or vertical pipelines. It is prefered that the installation is made in horizontal pipelines. The register face of singlejet meters (Unico2e) can be either on the top or at the side of the pipe. Multijet meters (MTK3e/MTW3e) must be installed in horizontal pipelines. The register face of multijet meters (MTK3e/MTW3e) must always on the top.



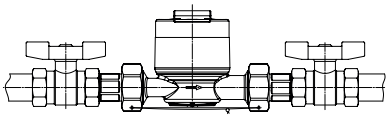
6. There are no requirements for straight lengths of pipe to be present at the inlet and outlet of these meters.
7. In order to guarantee correct measurement, it is very important to ensure that no air can enter the water meter or that the pipeline is allowed to run dry.



8. Excessive force when tightening the couplings/unions of the water meter must be avoided in order to prevent damage being caused to the housing of the water meter. Furthermore, the water meter must not be used as a lever for aligning the pipeline.
9. The pipeline should be securely fastened upstream and downstream of the water meter.
10. The water meter installation should be protected against mechanical shocks or vibration.
11. It is necessary to purge the pipeline before initial installation of the water meter. In place of the water meter a bypass piece must be installed, so that foreign objects do not block the strainer of the water meter. Thus, accurate measurement can be ensured.

12. Before installing the water meter, the protective caps must be removed and it must be ensured that a clean strainer is installed.
13. Pay attention to the direction of flow when installing the meter. An arrow on the water meter body indicates the direction of flow.
14. During installation it is important to check that the inside of the couplings/unions are clean, that the correct seals/gaskets are used and are intact and correctly positioned. Whenever a water meter is removed from the pipeline, discard and replace the old seals/gaskets. Do not use pipe sealant or PTFE tape on meter threads.
15. The union nuts are placed on the meter thread and tightened by hand in a first step. In the second step, the union nut is finally tightened by using a wrench until the connection is tight.
16. With only an upstream shut-off valve installed
    - Open slowly the shut-off valve to remove air from the pipeline prior to installation of the meter
    - Once the meter is installed, slowly open a consumer faucet
    - Close the consumer faucet
    - Observe the meter installation to ensure it is properly sealed w/o leaks.

    With an upstream and downstream shut-off valve installed
    - Close the downstream shut-off valve
    - Open slowly the upstream shut-off valve
    - Observe the meter installation to ensure it is properly sealed w/o leaks
    - Open slowly the downstream shut-off valve
    - Open slowly a consumer faucet to allow entrapped air to escape from pipeline
    - Close the consumer faucet
17. In order to prevent unauthorized manipulation of the water meter the couplings/unions must be secured by means of a wire and seals against tampering.



6. Inspection

GWF water meters are characterized by a long service life. The duration of use depends essentially on the water quality and the profile of the flow. We recommend that the meter is examined for the following points periodically.

1. The water meter and pipeline of the installation should be checked for leaks.
2. Pay attention that the water meter connections are securely attached and that all pipelines are undamaged and intact.
3. It should be verified that all shut-off valves upstream and downstream of the water meter are fully opened, and if they can be closed and there are no leaks present.
4. When the water supply is closed, the displayed volume should stop counting. When the water supply/inlet is slowly opened the displayed volume should begin to count slowly.
5. Check to see that the environment, in which the water meter is installed, is devoid of water, where dripping water onto the register could lead to water ingress.
6. The stamp on the seal should be verified if it is intact.
7. It should be verified that the ambient temperature lies within the admissible temperature range of the water meter.
8. Check that the meter and surrounding pipework is adequately protected from frost and freezing conditions.

7. Maintenance

As a rule, GWF water meters do not require any maintenance. If the supply network is subject to dirty conditions, it is recommended, to clean the strainer on the inlet of the water meter on a regular basis. To do this, the system pressure in the line must be relieved before starting work.

8. Recycling

It should be ensured that the water meters are disposed of correctly. The local and national regulations for environmental protection are to be considered, and products should be recycled where possible. For electronic water meters that contain electronics and a lithium/manganese battery, the following applies:

- Never dispose of the devices in household waste
- If necessary, request test certificates for the batteries used from the manufacturer.
- Store lithium/manganese batteries protected from moisture, do not throw into fire, do not short-circuit, do not open or damage and always keep out of the reach of children.

9. Radio specifications

LoRaWAN	
Frequency band	US902-928 MHz, ISM Band (902-928 MHz)
Transfer prot. (payload)	GWF specific
Radiated power	max. 20 dBm (100 mW)
Class	A
ADR (Adaptive data rate)	Yes
Activation type	OTAA

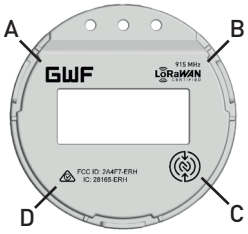
10. Conformity in California

NTEP Conformity only with local county wire seal.

11. Safety information about radio

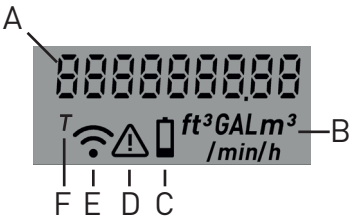
1. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.
2. This device complies with Part 15 of the FCC rules (FCC: Federal Communications Commission). Operation is subject to the following two conditions:
   (1) This device may not cause harmful interference, and
   (2) this device must accept any interference received, including interference that may cause undesired operation.
3. This device must be installed to provide at least 0.787 Inch separation from the human body at all times.
4. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures: Reorient or relocate the receiving antenna / Increase the separation between the equipment and receiver / Connect the equipment into an outlet on a circuit different from that to which the receiver is connected / Consult the dealer or an experienced radio/TV technician for help.

12. Device Dial



Unico2e, MTK3e, MTW3e	
A	Manufacturer
B	Radio communication (License free 915 MHz frequency band)
C	NFC interface
D	Device approval (FCC ID: 2A4F7-ERH for USA)

12.1. Device Display



Unico2e, MTK3e, MTW3e	
A	Cumulated Volume (9 digits)
B	Measuring Unit
C	Low battery icon
D	Alarm icon
E	Radio icon
F	Test Mode

A. The cumulated volume is displayed in GAL (US Gallons) or ft^3 (Cubic feet). The number of digits before and after the decimal point depends on the choosen unit and meter type.

B. Measuring unit (factory setting): US Gallons (GAL) or Cubic feet (ft^3) for volume, US Gallons per Minute (GAL/min) or Cubic feet per hour (ft^3/h) for flow rate

C. If low battery icon occurs, the whole meter must be replaced within 183 days.

D. The alarm icon occurs in case of a meter alarm. For details see chapter 12.5.

E. The radio icon shows the actual state of the radio communication.

F. After setting the meter in Test Mode by using additional tools, the letter "T" occurs in display.

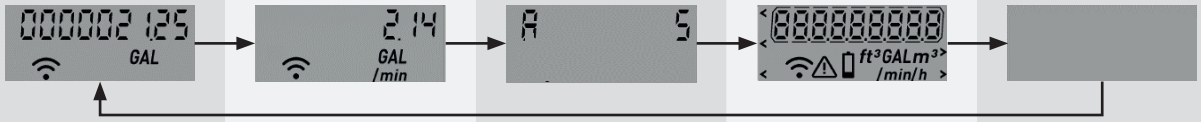
12.2. Delivery Status

The factory setting is the energy saving mode (stand-by mode). In this mode the radio transmission function is not yet activated in order to save battery power during shipping and stock. However, the meter can count the consumption.

12.3. Operating Mode - Radio Activation

Once the meter is installed, the radio transmission activates automatically after a defined volume passed through the meter --> Operating mode is active
The LoRaWAN join process, up to 3 min, starts and the following symbol (1 dot, 1 bar) is displayed. If join process fails, it will be repeated once a day. The symbol remains as follows: (1 dot, 1 bar). If join process was successful, the symbol (1 dot, 2 bars) is displayed.

12.4. Device Display Loop

Device display					
Example	Consumption: 21.25 GAL Radio: activated	Flow rate: 2.14 GAL/min	Alarm Code	Display test „ALL ON“	Display test „ALL OFF“

12.5. Overview Alarm Codes

Alarm Code	Type	Description	Troubleshooting	⚠
A0	No Alarm	–	–	No
A1	Potential leak	A continuous flow for a long period of time is detected	Check water network/system/taps against leakages	Yes
A2	Meter/radio communication error	Internal transmission incorrect	If this condition persists, replace the meter	Yes
A4	Meter/radio communication error	No internal transmission	If this condition persists, replace the meter	Yes
A10	Meter alarm	Magnetic tampering or impact of EMC or mechanical damage detected	Check for magnetic tampering, impact of EMC or mechanical damage. If this condition persists, replace the meter	Yes
A20	Burst pipe	High consumption in a short term is detected	Check water network and if necessary close shut-off valve	Yes
A40	Backflow	A flow in opposite direction is detected	Check water network and meter installation	Yes
A100	No Usage	No consumption for a long period of time detected	Check meter installation to ensure, meter is installed	Yes
A400	Low battery	Remaining battery lifetime < 183 days	Change device	Yes
A4000	Max. flow rate exceeded	Water meter was used above defined flow rate	Check water network parameters and/or install larger meter size	Yes
A10000	Min. Temp. Alarm	Water meter was used below defined Temp.	Check ambient and medium temp. on site	Yes
A20000	Max. Temp. Alarm	Water meter was used above defined Temp.	Check ambient and medium temp. on site	Yes
A40000	Meter failure	Metrological error	Replace the meter	Yes

If multiple alarms occur at the same time, the sum of the alarm codes will be displayed.

Determination of existing alarms	
A540	Alarm Code in display
-A400	Action: Substract the identical or next smaller Alarm Code --> Alarm A400 : Low battery
A140	Intermediate result
-A100	Action: Substract the identical or next smaller Alarm Code --> Alarm A100 : No Usage
A40	Intermediate result
-A40	Action: Substract the identical or next smaller Alarm Code --> Alarm A40 : Backflow
A0	End

Example: Alarm Code A540 --> Low battery (A400), No Usage (A100) and Backflow (A40) occur at the same time

All alarms are content of the radio protocol

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