Installation and Operating Instructions

GWF smart water meter sonico NANO - 868 MHz

Version 1.0

GWF

1. Safety instructions

- Avoid electrical shock during installation or removal, as pipelines may serve as grounding. Ensure electrical bypass as needed and follow local/national guidelines. GWF is not liable for improper bridging.
- Protect the meter and surrounding pipes from freezing to prevent damage. GWF assumes no liability for freeze-related damage.
- Protect meter from hydraulic impacts (water hammer/ cavitation.
- Open shut-off valves slowly after installation or if the meter has run dry to avoid pressure shocks.

GWF water meters are for residential potable water systems to measure low to medium flow rates. Only qualified technicians should handle installation and maintenance. The owner/operator is responsible for proper use; GWF is not liable for damages from misuse.

2. Safety information about radio

868 MHz: max. 14 dBm (25 mW)
Hereby, GWF AG declares that the radio equipment type Sonico NANO complies with Directive 2014/53/EU. The full text of the EU Declaration of Conformity is available at the following internet address: www.gwf.ch

3. Field of application

Model			Sonico NANO
Nominal diameter	DN	mm	15 / 20
Permanent flow rate	Q3	m³/h	1,6 / 2,5 / 4
Max. working pressure		bar	16
Max. medium temperature	T.	°C	30 / 50
Ambient temperature*	T.a	°C	-10…+70
Transport & Storage temp.		°C	-25…+70
Operating temperature		°C	-10…+70
Integrated interface			LoRaWAN and/ or Wireless M-Bus 868 MHz

*The displayed ambient temperature may differ from the actual temperature and high ambient temperatures may reduce battery lifetime.

4. Sizing of the water meter

GWF water meters must be sized correctly to avoid damage from overload. The maximum overload (Q4 = 1.25 * Q3) is allowed for 1 hour per day, up to 100 hours total over the meter's lifespan. Consider permanent flow, max pressure, and temperature limits when specifying the meter.

5. Inspection/ maintenance

GWF water meters have a long service life influenced by water quality and flow. Periodic checks should confirm no leaks, secure connections, intact seals, proper valve function, correct ambient temperature, and frost protection. Maintenance is generally unnecessary, but if water is dirty, clean the inlet strainer regularly after relieving system pressure. Follow OIML R49 Part 1 standards for installation and maintenance.

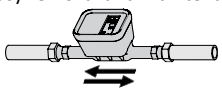
6. Recycling

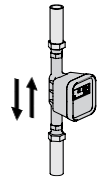
Dispose of water meters per local and national environmental regulations, recycling where possible. For electronic meters with lithium/manganese batteries:

- Do not dispose of household waste.
- Request battery test certificates if needed.
- Store batteries in a dry place, away from fire, avoid short-circuiting or damage, and keep out of children's reach.

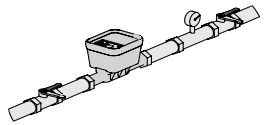
7. Installation instructions

1. **Avoid Sunlight and Frost**: Install the meter away from direct sunlight in a frost-free area, with a 10 cm clearance for easy reading and maintenance.
2. **Radio Signal Interference**: Avoid metallic surfaces and external cables around the meter to prevent interference with radio signals.
3. **Shut-off Valves**: Install shut-off valves upstream and downstream for easy removal and maintenance.
4. **Installation Orientation**: Sonico NANO meters can be installed horizontally or vertically with the display in any direction, including face-down.





5. **No Straight Pipe Requirements**: No straight pipe lengths are needed at the inlet or outlet (U0D0).
6. **Prevent Air Entry**: Ensure no air enters the meter and that the pipeline does not run dry for accurate measurement.
7. **Avoid Excessive Force**: Do not over-tighten the meter's couplings and avoid using the meter as leverage to align the pipeline.
8. **Secure Pipeline**: Fasten the pipeline upstream and downstream of meter to avoid movement or vibrations.



9. **Purge Pipeline Before Installation:** Clean the pipeline before initial installation to prevent blockages.
10. **Flow Direction:** Follow the meter's flow direction. If no arrow is shown, it can be installed in either direction, setting the direction automatically after flow starts.
11. **Seals and Cleanliness:** Ensure pipelines are clean and seals are correctly positioned. Replace seals with each installation and avoid using pipe sealant or PTFE tape on threads.
12. **Connection Process:** Tighten union nuts by hand first, then use a wrench for a secure fit.
13. **Initial Operation:** Open valves slowly to prevent air entrapment, ensuring a leak-free installation. Allow trapped air to escape by slowly opening a faucet.
14. **Tamper Prevention:** Secure couplings/unions with wire and seals to prevent unauthorized tampering.

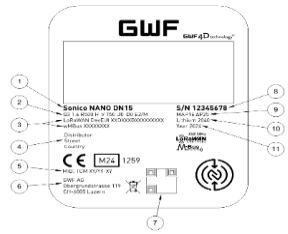
Caution: If the cover is removed, solar radiation may affect the readability of the LCD display.

8. Overview alarm codes

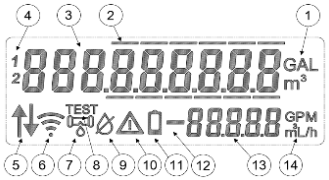
Alarm Code	Type	Troubleshooting	Auto reset
E1	Tampering	Contact GWF (Meter must be replaced)	No
E2	Water leak	Check piping system	Yes
E3	Water burst	Check piping system	Yes
E4	Air in pipe	Release air in piping system	Yes
E5	Empty pipe	Flush water	Yes
E6	Reverse flow	Check flow direction matching the arrow	Yes
E7	No usage	Flush water	Yes
E8	Battery low level	Replace meter	No
E9	Water temperature	Check water temperature	Yes
E10	Ambient temperature	Check water and ambient temperature	Yes
E12	Malfunction	Contact GWF (Meter must be replaced)	No
E13	Warning	Contact GWF (if condition persists, meter must be replaced)	No

9. Device dial and display

Device Dial		
	1. Product name and size	7. QR-code
	2. Metrology data	8. Serial number
	3. LoRa WAN EUI	9. Pressure/ head loss class
	4. wMBus number	10. Battery type
	5. MID certificate	11. Year of manufacturing
	6. Manufacturer	



Display	1. Volume unit indicator	8. Test mode information
	2. Non-billing relevant lines	9. Empty pipe icon
	3. Volume	10. System alarm icon
	4. Tariff zone	11. Battery level icon
	5. Main flow direction	12. Actual flow direction
	6. Radio status	13. Flow rate
	7. Leakage icon	14. Flow rate unit indicator



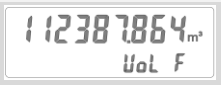
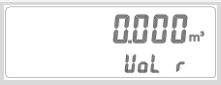
10. Overview radio symbols

At the end of production, the meter is may set to energy-saving standby mode, with radio transmission off to conserve batteries during shipping and storage, though it can still measure consumption. Once installed, the radio activates automatically after 5 liters of water flow within 3 minutes.

Scenario	Description	LCD
Standby mode	Meter in standby; not yet detecting water or NFC.	
Wake up on consumption - joining	Meter starts with water consumption and attempts to join a LoRa network, which is visible on the LCD (connection icon flashes).	
LoRa network joined	Meter successfully joined LoRa network and receives downlinks.	
LoRa network not joined	Meter attempts to join LoRa network once per day but no downlinks are received.	
LoRa network not joined (5 days)	After 5 days without successful connection, fallback mode activates with connection attempts every 9 or 24 days.	
Joined LoRa - downlink missing	Meter is connected to LoRa, but no downlink is received within the set time.	
Joined LoRa - fallback mode activated	Meter is connected to LoRa but no downlink is received, triggering fallback mode with attempts every 9 or 24 days.	

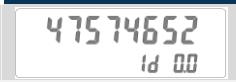
11. Device display loop

Activate the display loop with the GWF LIFE app. Every 10 minutes, the LCD shows firmware checksums and version for 2 seconds, with other segments disabled. The 9-digit field shows the firmware version and checksums, and the 5-digit field shows the identifier.

Display				
Example	1. Consumption: 112387.864 m³ Radio: activated	2. Display test "ALL ON"	3. Display test "ALL OFF"	4. FW version of the legally relevant firmware
Display				
Example	5. CRC32 value of the legally relevant firmware 1	6. CRC32 value of the legally relevant firmware 2	7. Volume forward: 112387.864 m³	8. Volume reverse: 0.000 m³
Display				
Example	9. Total one alarm: E5: Empty pipe	10 End of display sequence	11. Consumption: 112387.864 m³ Radio: activated	

12. WELMEC information sequence

The WELMEC Information Sequence displays essential data in a periodic sequence (default interval: 1 hour). This sequence includes information on firmware updates, fail counters, backup volume, and modified parameters.

	Index	LCD Display (hex)	Description
Serial number	0.0		first 4 letters “GWFR”
	0.1	30303030	second 4 letters “0000”
	0.2	32343031	third 4 letters “2401”
	0.3	32353034	last 4 letters “2504”
Update statistics	1.0-3.0		Timestamp: 1h 9min 29s
	1.1-3.1	1977.05.27	Timestamp: year=1977 month=5 days=27
	1.2-3.2	xxxxxxxx	Checksum
	1.3-3.3	001.001.032	Version=1.1.32 [maj.min.build]
Fail counterer	4.0		Timestamp of the last fail: 2h 11min 42s
	4.1	2022.10.31	Timestamp of the last fail: year=2022 month=10 day=31
	4.2	00000032	Fail Counter
Volume information	5.0		Timestamp: 2h 11min 42s
	5.1	2023.07.27	Timestamp: year=2023 month=07 day=27
	5.2	xxxxxxxx m3	Cumulative volume in m³
	5.3	xxxxxxxx m3	Reverse volume in m³
	5.4	xxxxxxxx m3	Forward volume in m³
	5.5	xxxxxxxx	Checksum
Modified parameters	6.0		User should expect 1 Fields with change log
	7.0	0000004d	Parameter ID (Legal info display period)
	7.1	000000f3	Modification counter (was modified 243 times)
	7.2	00020b02	Change Timestamp: 2h 12min 2s
	7.3	00081b08	Change Timestamp: year=2075 (0x81b) month=8
	END (EOD)		End of WELMEC Sequence data log

For detailed information, please scan QR- code information or visit website: https://productfinder.gwf.ch/sonico-nano