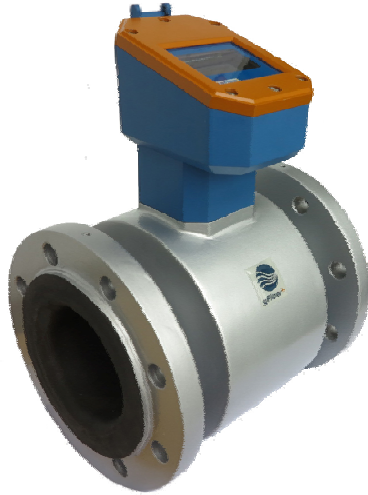


Technical Specification

NautiFlow™ NF-1

Battery Powered Electromagnetic flowmeter



Intelligent energy efficient flowmeter for municipal/irrigation water industry

Application

- The electromagnetic measuring principle is unaffected by pressure, temperature and flow profile
- Fully suitable for standard applications in the water and irrigation industry
- Direct replacement of turbine flowmeter or paddle water meter on your center pivot
- Best fit for in field solar panel powered applications

Features

- High precision - thanks to our high SNR flow sensor and measurement circuitry
- Dual power mode
- Tamper sealed
- Transmitter housing made of casted aluminum
- User friendly AMR interface
- Optional communication kit supporting multiple communication protocols
- Optional external battery kit for long term operation

Your benefits

- No more clogging on the pipe line - no moving parts and open bore
- Install and Measure - no initial setup or configuration needed
- Water seal quick connector on meter - no more wiring work on the meter
- IP68 protected device give you confident on all weather condition
- Energy-saving flow measurement – no more need of huge solar panel
- No power grid required – battery lifetime of up to 10 years(with extension battery kit)
- Worldwide transmission of measured data and events – with optional GSM/GPRS module
- Reliable data storage - Optional data logger

Flow measurement

Measured variable

Direct measured variables

Volume flow (proportional to induced voltage)

Measuring range

DN(mm)	Q1 (m ³ /h)	Q2(m ³ /h)	Q3(m ³ /h)	Q4(m ³ /h)	R
50 (2")	0.25	0.4	40	50	160
80 (3")	0.63	1	100	125	159
100 (4")	1	1.6	160	200	160
150 (6")	2.5	4	400	500	160
200 (8")	3.9	6.3	630	788	162
250 (10")	6.3	10	1000	1250	159
300 (12")	10	16	1600	2000	160

Measuring performance

0.5% o.R. from 10% to 100% flow range

1% o.R. rest of flow range

Display unit

Rate

Gallon Per Minute, Litter Per Minute, Cubic Meter per Hour, Gallon Per Second, Litter Per Second, Cubic Meter per Minute

Total

Gallon, Gallon x1000, Litter, Litter x1000, Cubic Meters, Cubic Meters x1000

Pressure

kPa, psi

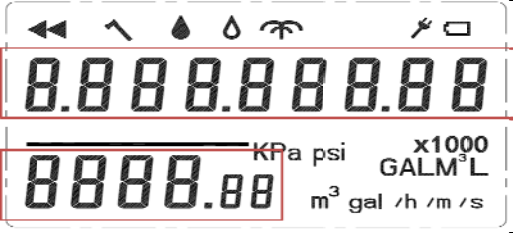

Human Machine Interface

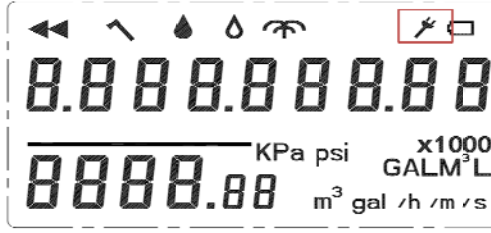
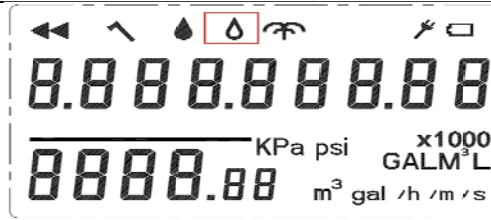
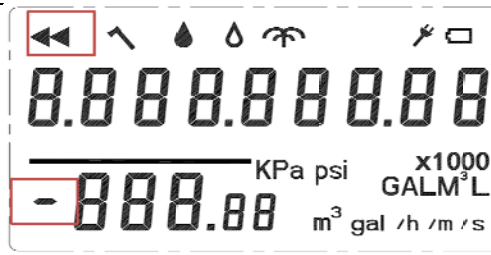
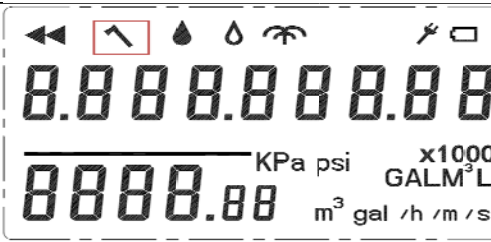
Display

128 segments ultra low power LCD, wide view angle

Keypad

1x reed relay for switching units

<p>Upper line shows total flow accumulation value Lower line shows current flow rate</p>	 <p>The image shows a two-line LCD display. The top line displays eight digits '0.0000.0000'. The bottom line displays four digits '0000.00'. To the right of the bottom line, there are unit indicators: 'KPa psi' and 'x1000 GALM³L' above 'm³ gal /h /m /s'. Above the top line are several icons: a left arrow, a caret, two water droplets, a fan, and a square with a diagonal line. A red box highlights the top line, and another red box highlights the bottom line.</p>
<p>Battery low alarm indicator</p>	 <p>The image shows the same two-line LCD display as above. The top line displays eight digits '0.0000.0000'. The bottom line displays four digits '0000.00'. To the right of the bottom line, there are unit indicators: 'KPa psi' and 'x1000 GALM³L' above 'm³ gal /h /m /s'. Above the top line are several icons: a left arrow, a caret, two water droplets, a fan, and a square with a diagonal line. A red box highlights the top line, and another red box highlights the bottom line. Additionally, a red box highlights the battery low alarm icon (a square with a diagonal line) in the top right corner of the icon row.</p>

External power connection indication	
Empty pipe alarm indication	
Reverse flow alarm indication	
Tamper seal broken alarm	

Output

Output signal

Pulse output

Passive

Opto-MOS (opto-isolated output)

Breakdown voltage: 30V DC

Isolated from other secondary circuits: 500V DC

Frequency output

0~200Hz, 50% duty cycle

Communication

UART (Isolated from secondary circuits: 500V DC)

Alarm indicator

Empty pipe detection

Reverse flow

Low battery

External power

Burst (user defined)

Leakage (user defined)

Power supply

Supply voltage

Power from batteries

3.6 V DC
76 Ah nominal capacity at 20 °C
Max. power: 5 mW
Battery life : 5 years

Supply voltage via external power supply

8 to 32 V DC
Max. power: 40 mW
A battery to act as a backup if the power supply fails

Power consumption

Switch-on current

Max. 0.5 A at 24 V DC

Process

Temperature	0~40°C
Pressure	150 psi
Min. Conductivity	50 S/cm
Connection	ANSI B16.5 #150 flanges

Environment

Ambient temperature

Operation temperature

-10~55°C

Storage temperature

-20~60°C

CE Marking

Electrical Static Discharge

IEC61000-4-2, 6kV direct discharge, 8kV discharge

Radiated RF fields

IEC 61000-4-3, 80MHz~1000MHz 10V/m, 1000MHz ~ 2700MHz:3V/m

Electrical fast transient/burst

IEC 61000-4-4 1kV on cable

Surge

IEC 61000-4-5, 1kV on cable, 1,2/50s wave

Conducted RF disturbances

IEC 61000-4-6, 0.15~80MHz 3V

Electromagnetic compatibility

IEC 61000-4-8, 10A/m

Mechanical Shock

IEC 68-2-27, half sine wave, 300g, 3 axles

Approval

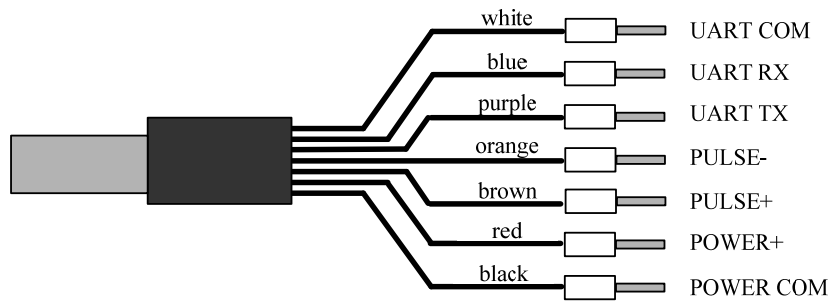
WRAS (pending)

NSF 61 (pending)

Protection Level

IP68

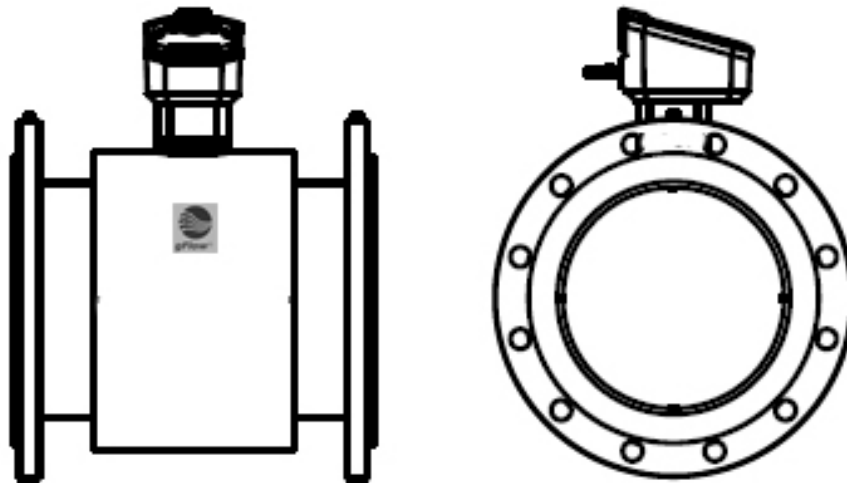
Electrical Connection



Pin definition

UART COM:	Common pin of UART communication
UART RX:	Data receiving pin of UART communication
UART TX:	Data sending pin of UART communication
PULSE-:	Pulse output positive pin
PULSE+:	Pulse output negative pin
POWER+:	8~32V DC power input
POWER-:	Power ground pin

Installation dimension and weight



Size [mm]	Dimensions[mm]			Gross weight [lb]
	L	H	W	
50 (2")	200	260	165	24
80 (3")	200	280	200	
100 (4")	250	300	225	40
150 (6")	300	333	300	54
200 (8")	350	360	375	88
250 (10")	450	410	395	118
300 (12")	500	451	445	168

Materials

Sensor material	Electrodes 316 Stainless steel
	Liner Rubber
	Flow tube 304 Stainless steel
	Sensor body Carbon steel
	Sensor body paint Epoxy coated anti-corrosion paint
IP connection	LEMO 0K series
Electronics Housing	Casted aluminum, power coated
Sealing O-Rings	EPDM
Tamper wire	Stainless steel

Optional accessories

Power and signal cable	Standard with length of 15ft, 25ft, 50ft, custom length up on request
Communication module	Modbus RS-485, CAN, RS-232, USB
External battery pack	76Ah, extend operation time up to 10 years
Solar package	10W solar power panel with rechargeable Li batteries
Data logger	With 32MB data capacity

Shipping dimension and weight

Size [inches]	Dimensions [inches]			Shipping weight [lb]
	L	H	W	
2	20	12	14	32
4	20	12	14	40
6	20	12	14	54
8	28	17	18	88
10	22	20	18	118
12	25	22	21	168

Order structure

NF-1	-	AAA	BBB	C	DDD	
Model						
NF1-						
		AAA	Size			
		002	2" size			
		004	4" size			
		006	6" size			
		008	8" size			
		010	10" size			
		012	12" size			
		xxx	Special version			
			BBB	Rate unit		
			GPM	Gallon Per Minute		
			LPM	Litter Per Minute		
			CMH	Cubit Meter per Hour		
			GPS	Gallon Per Second		
			LPS	Litter Per Second		
			CMM	Cubit Meter per Minute		
				C	Unit per pulse	
				0	10 unit per pulse	
				1	100 unit per pulse	
				2	1000 unit per pulse	
				3	0-200Hz frequency output	
					DDD	Cable length
					000	No cable needed
					010	10 ft cable
					015	15ft cable
					025	25ft cable
					050	50ft cable
					100	100ft cable
					xxx	custom length
