

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

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
40 (1 1/2")	0.16	0.256	40	50	250
50 (2")	0.25	0.4	62.5	78.1	250
65 (2 1/2")	0.39	0.624	97.5	121.9	250
80 (3")	0.63	1.008	157.5	196.9	250
100 (4")	1	1.6	250	312.5	250
125(5")	1	1.6	250	312.5	250
150 (6")	2.5	4	625	781.3	250
200 (8")	3.94	6.304	985	1231.3	250
250 (10")	6.25	10	1000	1250	160
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

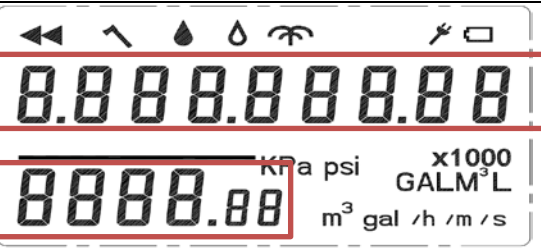
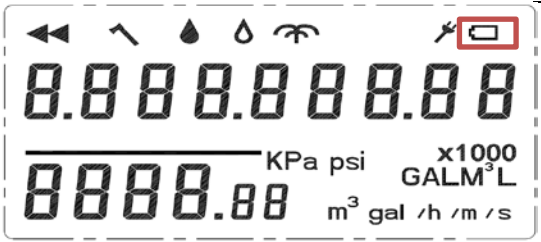
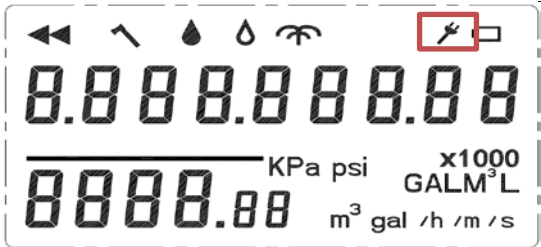
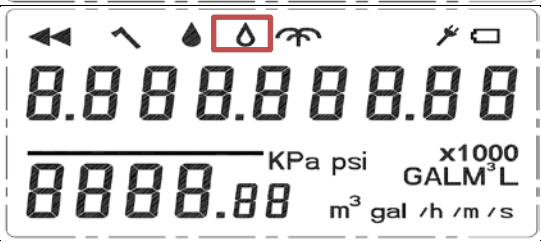
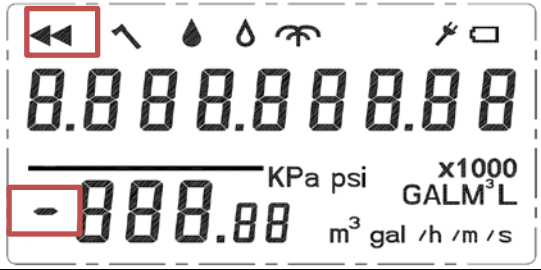
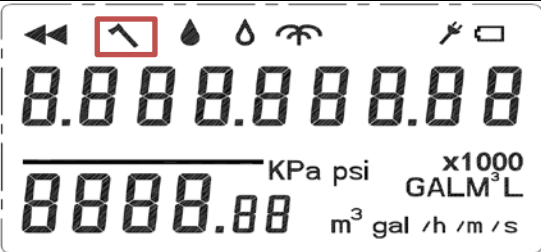
Gallon, Gallon x1000, Litter, Litter x1000, Cubic Meters, Cubic Meters x1000

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>Battery low alarm indicator</p>	
<p>External power connection indication</p>	
<p>Empty pipe alarm indication</p>	
<p>Reverse flow alarm indication</p>	
<p>Tamper seal broken alarm</p>	

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
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Communication	UART (Isolated from secondary circuits: 500V DC) GSM/GPRS remote sending
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 : 7 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
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Power consumption	Switch-on current Max. 0.5 A at 24 V DC
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Process

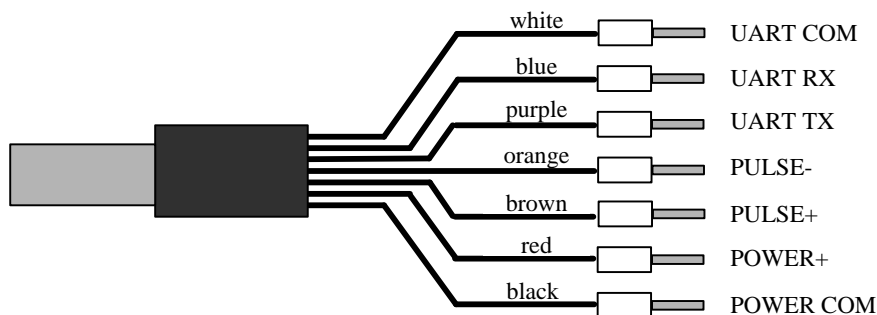
Temperature	0~40°C
Pressure Rating	BS-EN 1092-2:1997 PN 16
Min. Conductivity	50 µS/cm
Connection	BS-EN 1092-2:1997 PN 16

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/Certificate	ISO4064:2005 CE Mark WRAS

Protection Level IP68

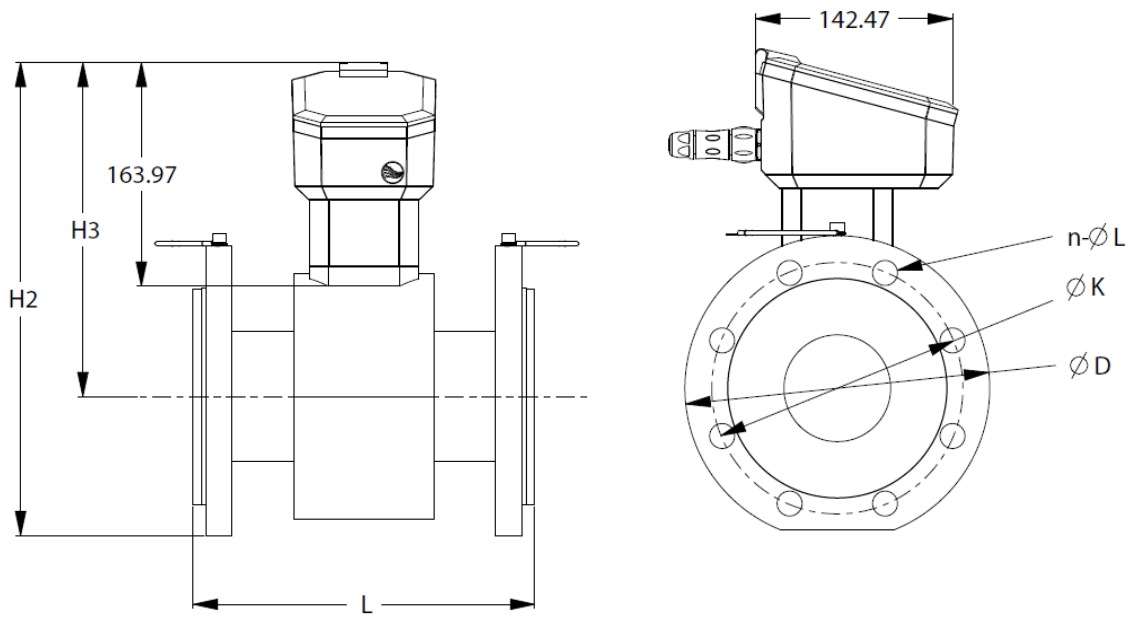
Electrical Connection



Pin definition

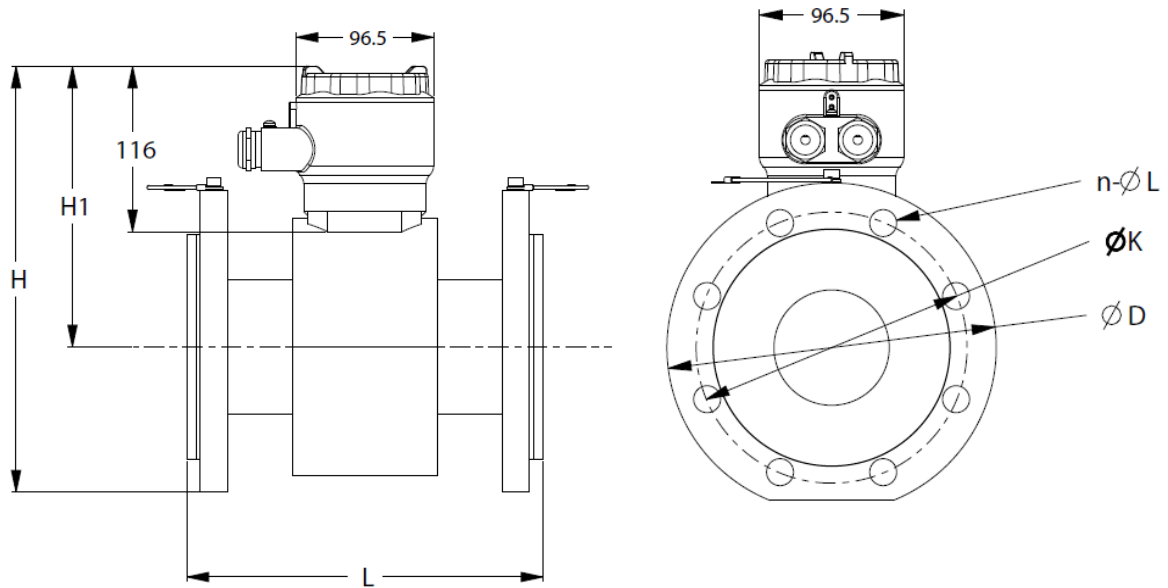
UART COM:	Common pin of UART communication
UART RX:	Data receiving pin of UART communication
UART TX:	Data sending pin of UART communication (can be configured two pulse output)
PULSE-:	Pulse output positive pin
PULSE+:	Pulse output negative pin
POWER+:	8~32V DC power input
POWER-:	Power ground pin

Installation dimension and weight



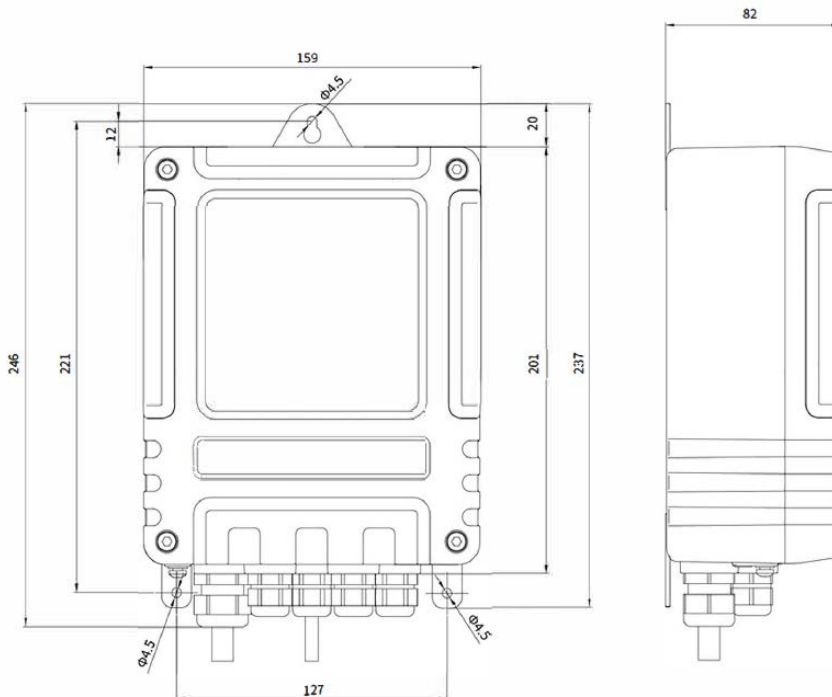
Dimension for integral type

Size [mm]	Dimensions[mm]			Flange			Approx. weight kg
	H2	H3	L	D	K	n-ØL	
40 (1 1/2")	285	217	200	150	110	4-Ø18	12
50 (2")	290	220	200	165	125	4-Ø18	14
65 (2 1/2")	314	231	200	185	145	8-Ø18	16.3
80 (3")	331	240	200	200	160	8-Ø18	18.5
100 (4")	347	245	250	220	180	8-Ø18	28.5
125(5")	371	255	250	250	210	8-Ø18	33
150 (6")	400	270	300	285	240	8-Ø22	38
200 (8")	447	287	350	340	295	12-Ø22	50
250 (10")	493	303	450	405	355	12-Ø26	63
300 (12")	543	328	500	460	410	12-Ø26	80



Dimension for remote type (sensor part)

Size [mm]	Dimensions[mm]			Flange			Approx. weight kg
	H	H1	L	D	K	n-ØL	
40 (1 1/2")	237	169	200	150	110	4-Ø18	14.1
50 (2")	242	172	200	165	125	4-Ø18	16.1
65 (2 1/2")	266	183	200	185	145	8-Ø18	17.5
80 (3")	283	192	200	200	160	8-Ø18	20.4
100 (4")	299	197	250	220	180	8-Ø18	31
125(5")	323	207	250	250	210	8-Ø18	35
150 (6")	352	222	300	285	240	8-Ø22	41
200 (8")	399	239	350	340	295	12-Ø22	52
250 (10")	445	255	450	405	355	12-Ø26	67
300 (12")	496	281	500	460	410	12-Ø26	87.4



Dimension for transmitter

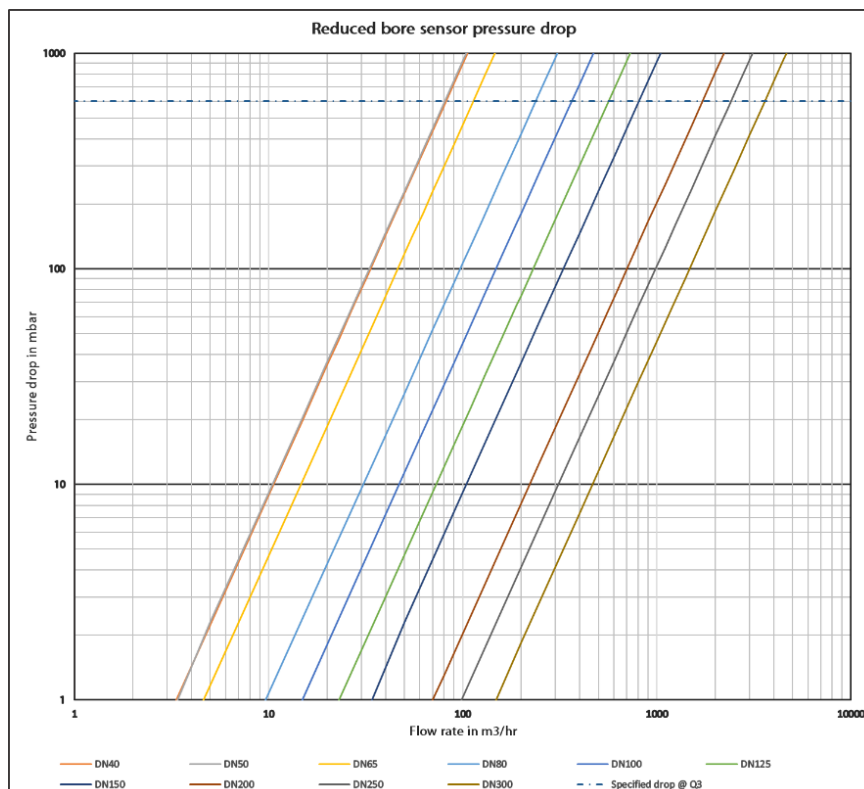
Materials

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

Reduced bore sensor pressure drop



Order structure

NF1 AAA -BBB -CCCC -DDDD -EEEE -FFF
 Model
 NF-1-

AAA Size
 112 DN40 (1 1/2")
 002 DN50 (2")
 003 DN80 (3")
 004 DN100 (4")
 006 DN150 (6")
 008 DN200 (8")
 010 DN250 (10")
 012 DN300 (12")
 014 DN350 (14")
 016 DN400 (16")
 018 DN450 (18")
 020 DN500 (20")
 xxx Special size

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

CCCC Process connection
 A1 ANSI 150# flange
 A2 ANSI 300# flange
 A3 ANSI 600# flange
 D1 DIN PN16 flange
 D2 DIN PN25 flange
 D3 DIN PN40 flange
 D4 DIN PN63 flange
 B1 BS4054 PN16
 B2 BS4054 PN25
 B3 BS4054 PN40

DDDD Transmitter type and communication
 0001 Compact transmitter with RS-485
 0002 Compact transmitter with GPRS
 0010 Remote transmitter with RS-485
 0012 Remote transmitter with GPRS

EEEE Optional
 0000 None
 0001 Solar package
 0002 Data logger
 0003 4~20mA output module