


NautiFlow NF1 Gen. 2 *Electromagnetic Flowmeter* Technical Datasheet

ACCURATE
RELIABLE
CONNECTIVITY



ISO 9001 QMS Certified

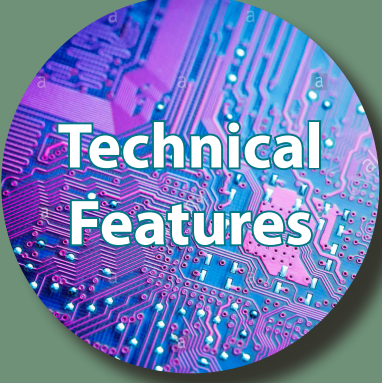


***G**Flow+ has been providing intelligent water and energy metering solution since its foundation in 2012. Led by a group of innovative engineers, gFlow+ focuses on creating the entire smart metering system for sustainable applications.*

Launched in 2015, the Nautilus series unveiled gFlow+'s cutting-edge measurement and low-power management technology. Combining accuracy, efficiency and reliability, the Nautilus series has reset the market's expectations for a smart water meter. A unique set of smart metering solutions, from flow sensor to analytical software, are provided. This enables property managements, businesses, and utilities to manage water consumption, water quality, and energy consumption all in one platform.

And this is just the beginning. We believe that electric solid-state meter and IoT are the future.

GFLOW+, BE PROACTIVE!



Technical Features

- High precision - supported by high SNR flow sensor and signal processing design
- Multiple power modes: Battery, External DC and Renewable Energy
- Tamper-proof for water billing application
- Wide measuring range: Q3/Q1 up to R400
- No straight upstream or downstream pipe required (U0-D0), even behind a 90° bend
- IP68 rated design
- Metrology conforming to OIML R49:2013 and ISO 4064:2014 standards
- Made according to ISO 20456:2017



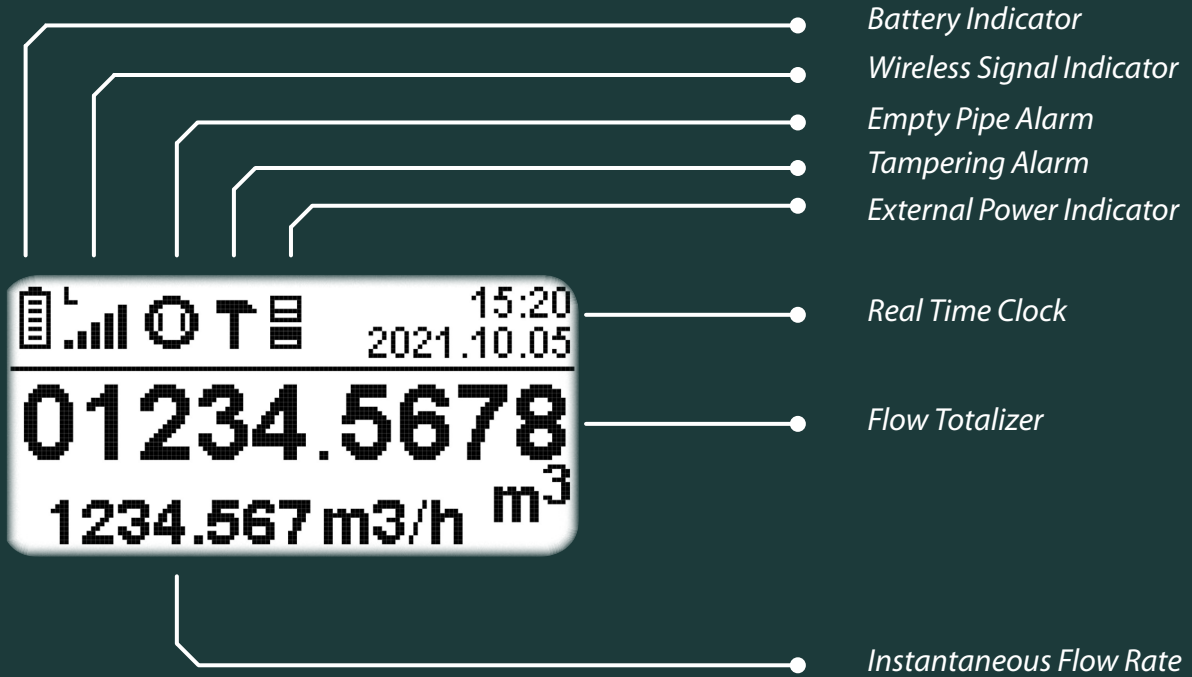
Applications

- Industrial, agricultural and residential water metering
- Truly IoT-based smart meter, Automated Meter Reading (AMR) through integrated wireless metering endpoint, transmitting through GPRS, NB-IoT, LoraWan protocols
- District Metering Area (DMA)
- Leakage detection
- Other sustainable energy applications



Your Benefits

- Non-moving wetted part design, no clogging in the pipe
- MIL-DTL-26482 specified quick connection for easy and reliable cable coupling work under harsh environment
- IP68 protection class, reliably under flooding environmental condition
- Battery lifetime up to 10 years, no power grid required
- RS-485 Modbus/Pulse/mA interface, suitable to most industrial application



Safe Lining for Drinking Water

Safe for potable water distribution, conforming to WRAS



IP68, NEMA 6P Protection

Meters are, as standard, inherently submersible thus ensuring suitability for installation in metering chambers which are prone to flooding condition

Various Flange Options

Supporting ISO7005, DIN, EN1092-1 PN10/ PN16/ PN25 ANSI/ASME B16.5/16.47 Series B Class 150/ Class 300/Class 600 AS 4087 PN16 AS2129 Table D/Table E JIS 5K/7.5K/10K

EN ISO 12944 C4 Grade

High corrosion resistance. $\geq 70 \mu\text{m}$ thick paintcoat brings long-lasting corrosion resistance, even in arduous environment

Advanced Sensor Structure Design for Various Flow Profile

Neither upstream nor downstream straight pipe required

Direct-Attached Antenna

Wide band-width antenna supporting most RF communication protocols

Wireless Meter Configuration

Easily configured by PC/ mobile phone through Bluetooth

MIL-C-26482 Connector

Waterproof with fast cable connection

Award-Winning Industrial Design

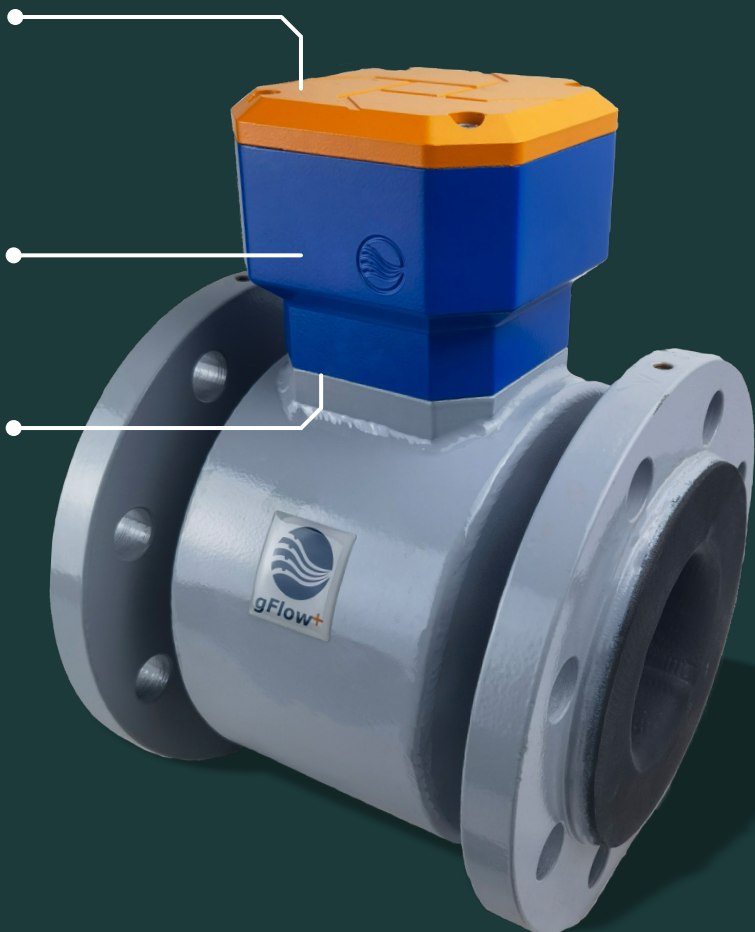
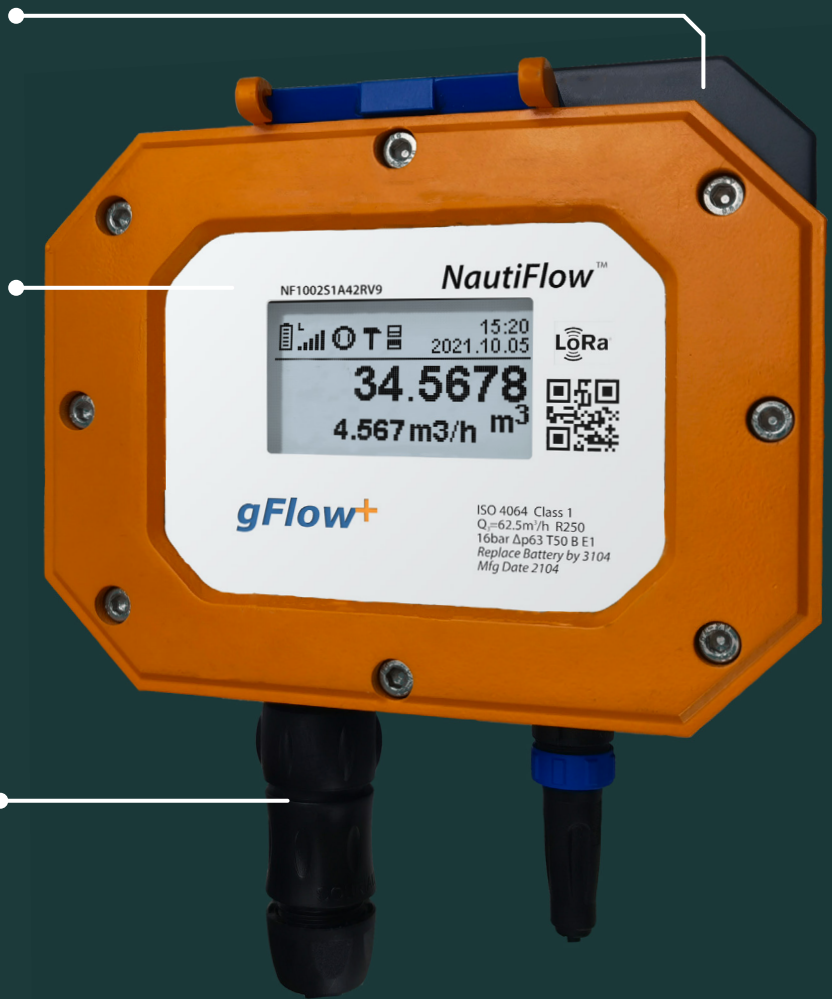
Composite powder coatings provide long-lasting and easy-to-see color in the complex pipeline

Precisely CNC Machined Housing

Bringing toughness and avoiding EMC disturbance

Vibration-Resistant Design

Tested according to IEC 60079. Able to withstand long-term vibration of the pipeline and shock during operation



Technical Data and Specifications

Flow Measurement	
Measuring Principle	Farady's Law of Induction
Property of Interest	Flow velocity and volume
Applicable Media	Electrical-conductive fluids
Measurement Accuracy	Class 1/ Class 2 under ISO 4064
Repeatability	0.2%
Flowrate Unit	gal/min, gal/s, L/min, L/s, m ³ /min, m ³ /h
Volume Unit	gal, kGal, L, m ³ , k m ³
Measurable Direction	Forward and reverse flows

Operating Conditions	
Process Temperature	0 to 60 °C (32 to 140 °F)
Ambient Temperature	-10 to 55 °C (14 to 131 °F)
Storage Temperature	-20 to 60 °C (-4 to 140 °F)
Temperature Class	T50
Max. Allowable Pressure	16 bar
Physical Media	Potable water, industrial water, irrigation water
Min. Conductivity	50 µS/cm
Pressure Loss	<0.63 bar (detailed information presented in Figure 1)
Inlet Run	≥ 0 DN
Outlet Run	≥ 0 DN
Metrology	OIML R49-2013, ISO 4064:2014
Mechanical Environ. Class	Class C
Electromagnetic Environ. Class	Class E2
CE Marking	
Electrical static discharge	IEC 61000-4-2, 6 kV direct discharge, 8 kV discharge
Radiated RF fields	IEC 61000-4-3, 80 ~ 1000 MHz 10 V/m, 1000 ~ 2700 MHz 3 V/m
Electrical Fast Transient/Burst	IEC 61000-4-4, 1 kV on cable
Surge	IEC 61000-4-5, 1 kV on cable, 1 to 2/50 s wave
Conducted RF Disturbances	IEC 61000-4-6, 0.15 ~ 80 MHz 3V
Electromagnetic Compatibility	IEC 61000-4-8, 10 A/m
Mechanical Shock	IEC 68-2-27, half sine wave, 300g, 3 axes

Technical Data and Specifications

Process Connection Options	
EN 1092 Flange	PN 10, PN 16, PN 25
ASME B16.5 Flange	Class 150, Class 300, Class 600
JIS B2220 Flange	JIS 5K, JIS 7.5K, JIS 10K
AS 2129 Flange	Table D, Table E
AS 4087 Flange	PN 16
Other Type Flanges	Customization available upon request

Electrical Specification	
Power Supply	
Internal Battery	3.6 V DC, 95 Ah nominal capacity at 20°C, Max. power: 5mW
Battery Life	10 years
External Power Input	8 to 32 V DC, Max. power: 40 mW
Output Signal	
Pulse Output	Passive, Opto-MOS, breakdown voltage: 30 V DC Galvanic Isolation: 500 V DC
Output Frequency	0-1000 Hz, with adjustable duty cycle
Communication	
Protocol	RS-485 Modbus, 500VDC galvanically isolated
Others	
Keypad	Reed relay
Memory	Able to store up to 8192 logging data
Display	128x64 pixel ultra-low-power LCD, wide view angle
Alarm Indicator	Empty pipe, reverse flow, low battery, tamper detection, external power

Material Information	
Measuring Tube	Stainless steel 304
Sensor Housing	Carbon steel (stainless steel 304 optional)
Flanges	Carbon steel (stainless steel 304 optional)
Electrodes	Stainless steel 316L
Liner	Neoprene rubber (WRAS certified)
Junction Box	Powder coated aluminum alloy
Grounding Rings	Stainless steel 304 (316L optional)
Sealing O-Rings	EPDM
Transmitter Housing	Powder coated aluminum alloy

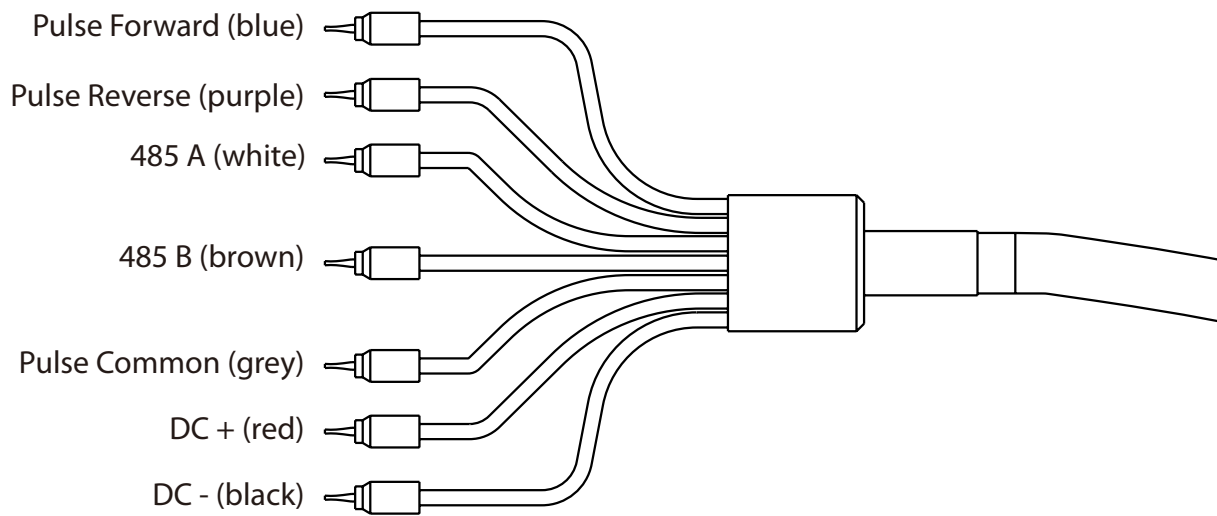
Technical Data and Specifications

Measurement Range [Class 1]					
Q2/Q1=1.6 Q4/Q3=1.25 Q3/Q1=R					
DN (mm)	Q1 (m³/h)	Q2 (m³/h)	Q3 (m³/h)	Q4 (m³/h)	R
40	0.10	0.16	25	31.25	250
50	0.16	0.26	40	50.00	250
65	0.25	0.40	63	78.75	250
80	0.40	0.64	100	125.00	250
100	0.64	1.02	160	200.00	250
125	0.64	1.02	160	200.00	250
150	1.60	2.56	400	500.00	250
200	2.52	4.03	630	787.50	250
250	4.00	6.40	1000	1250.00	250
300	6.40	10.24	1600	2000.00	250

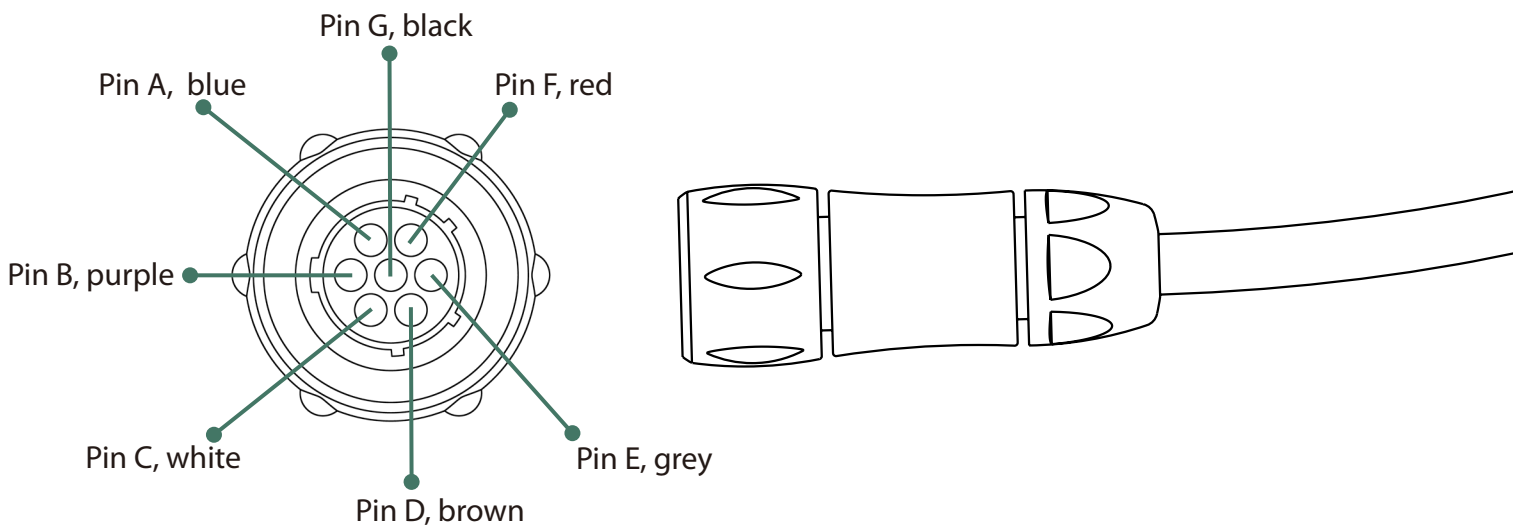
Measurement Range [Class 2]					
Q2/Q1=1.6 Q4/Q3=1.25 Q3/Q1=R					
DN (mm)	Q1 (m³/h)	Q2 (m³/h)	Q3 (m³/h)	Q4 (m³/h)	R
40	0.06	0.10	25	31.25	400
50	0.10	0.16	40	50.00	400
65	0.16	0.26	63	78.75	400
80	0.25	0.40	100	125.00	400
100	0.40	0.64	160	200.00	400
125	0.40	0.64	160	200.00	400
150	1.00	1.60	400	500.00	400
200	1.58	2.53	630	787.50	400
250	2.50	4.00	1000	1250.00	400
300	4.00	6.40	1600	2000.00	400

Optional Accessories	
Communication Adaptors	Modbus RS-485, USB including configuration enclosure, 25cm cable from meter to enclosure and 75cm USB cable from enclosure to PC
Solar Package	10 W solar power panel with rechargeable Li-batteries
4~20 mA Output Module	Converting pulse signal to 4~20 mA output for control system
Replacement Kit	Including 1 D size 76Ah high-performance battery pack, 1 D size 19Ah battery, O-rings between meter cover and housing, together with 25g silicon sealant

Technical Data and Specifications



Pin Definition	
Pulse Forward	Pulse output for the forward flow
Pulse Reverse	Pulse output for the reverse flow
485 A	Terminal A for RS-485 communication
485 B	Terminal B for RS-485 communication
Pulse Common	Common pin for the pulse output
DC +	Positive pin of 8~32V DC power input
DC -	Ground pin of 8~32V DC power input



Technical Data and Specifications

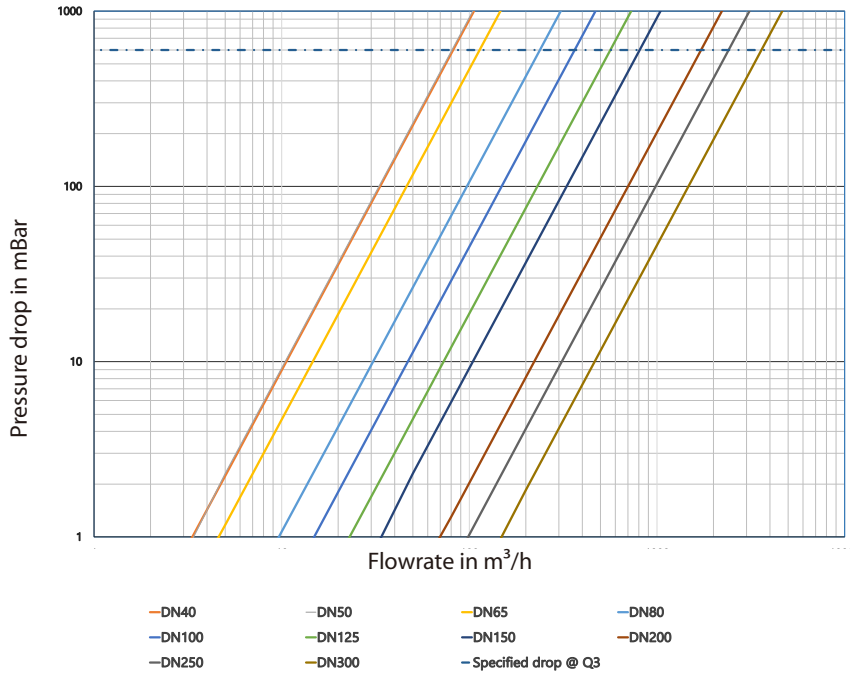


Figure 1. Sensor Pressure Drop Plot

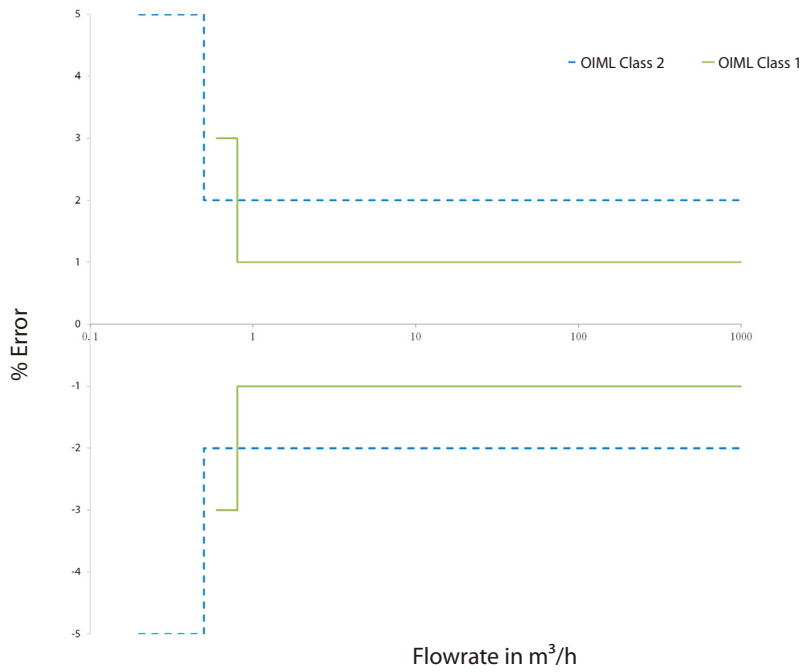
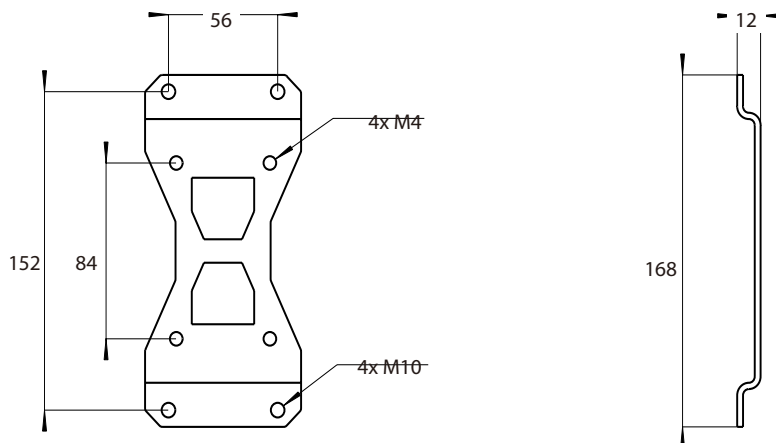
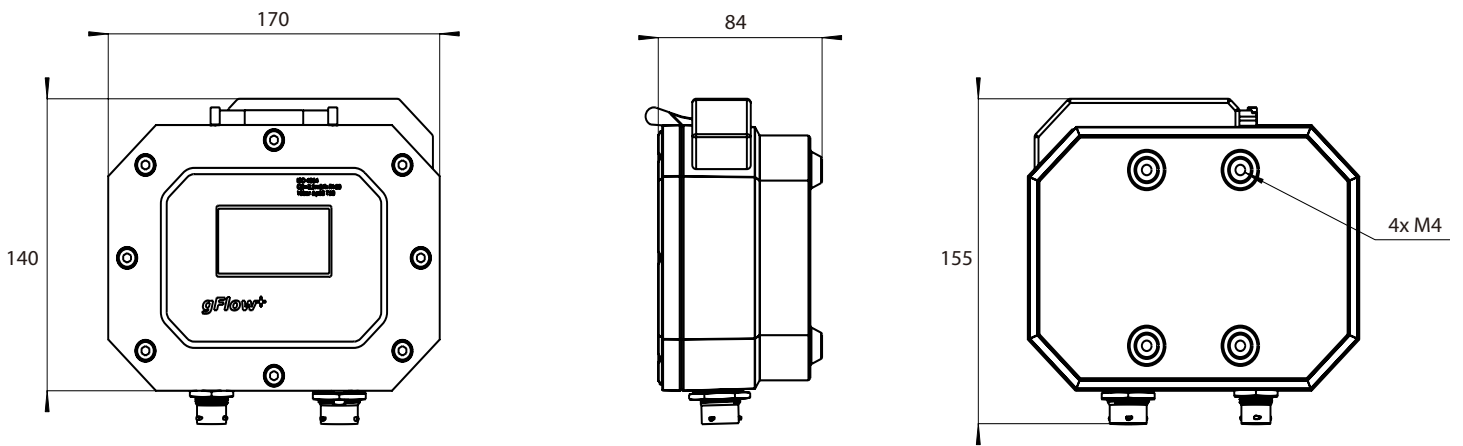
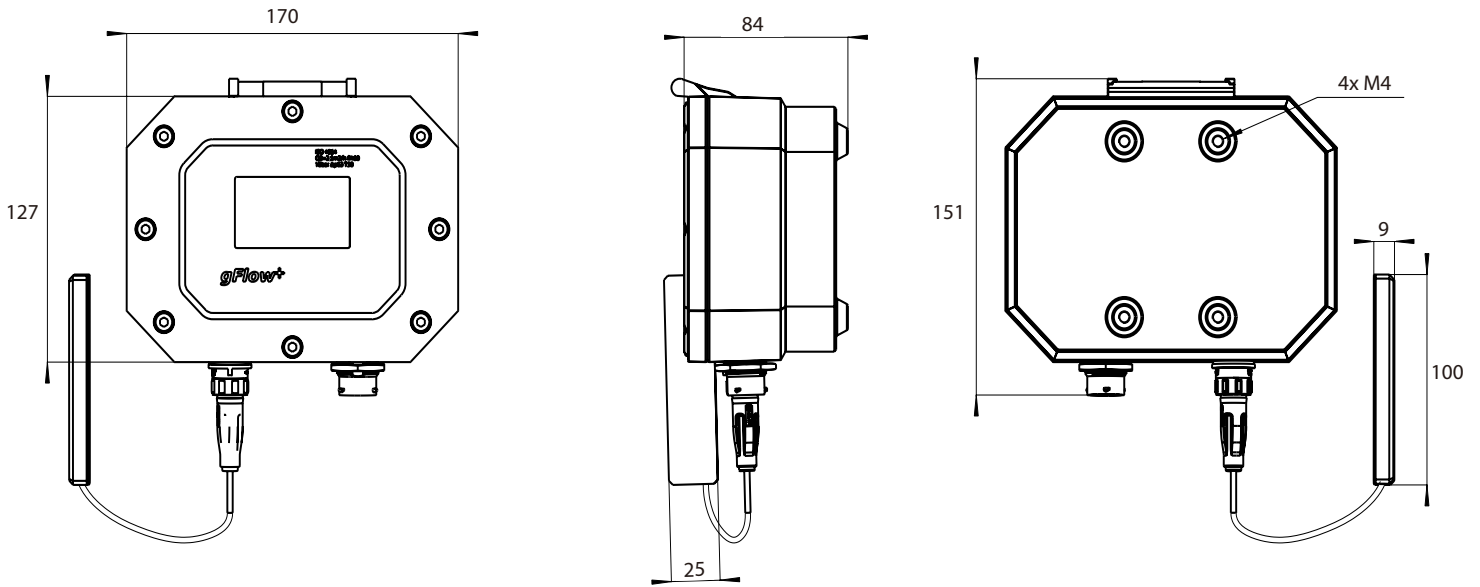
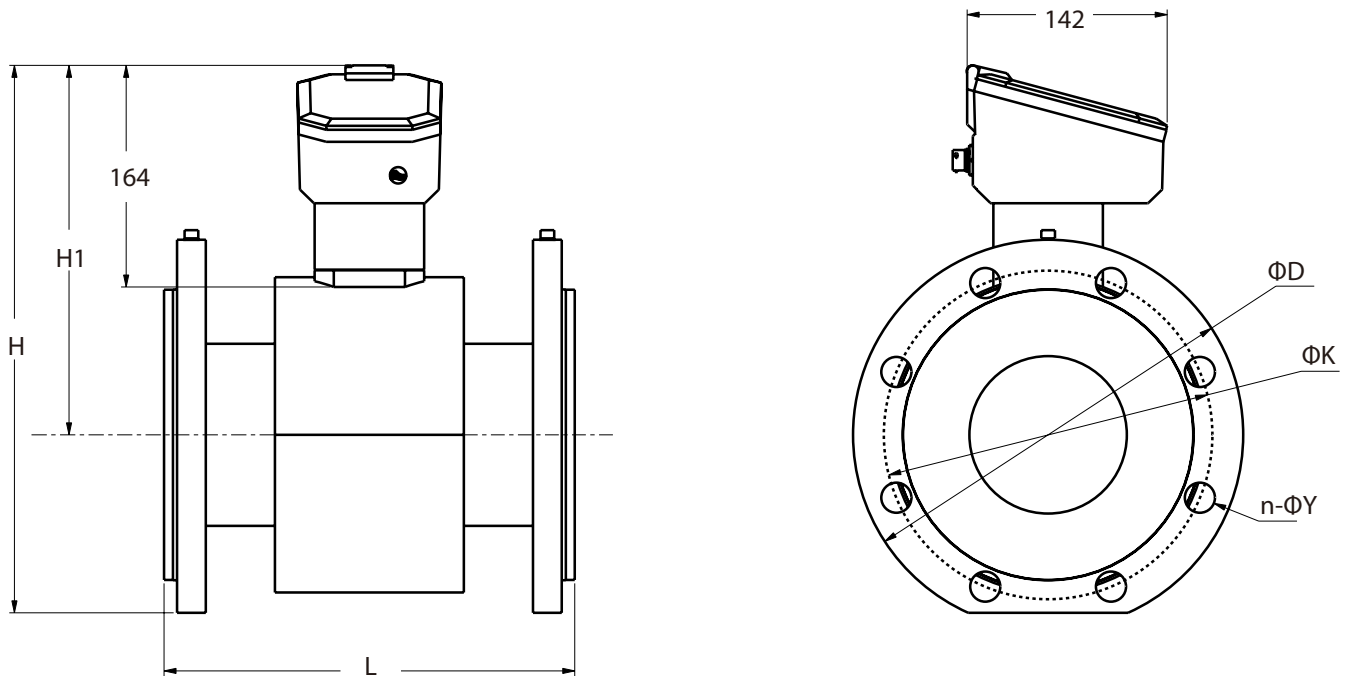


Figure 2. Metrological Performance under OIML-R49

Dimensions



Dimensions

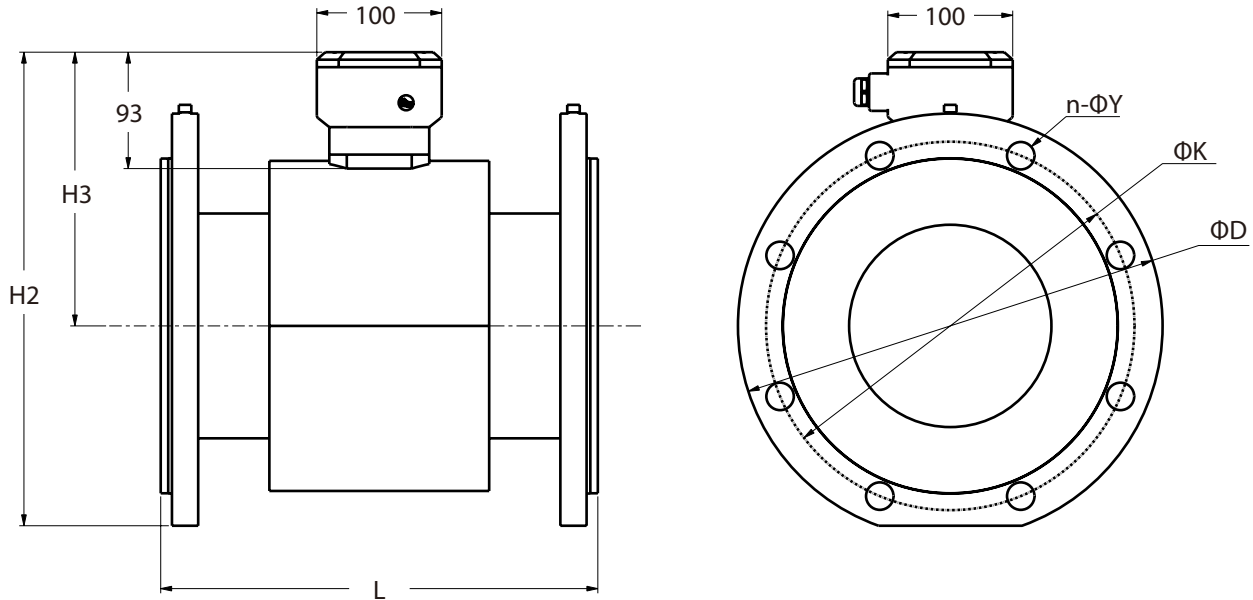


Installation Dimension and Weight (Integrated)

Size [mm]	Dimensions [mm]			Flange [mm]			Approx. Weight [kg]
	H	H1	L	D	K	n- ΦY	
40	285	217	200	150	110	4- $\Phi 18$	12
50	290	220	200	165	125	4- $\Phi 18$	14
65	314	231	200	185	145	8- $\Phi 18$	16
80	331	240	200	200	160	8- $\Phi 18$	19
100	347	245	250	220	180	8- $\Phi 18$	29
125	371	255	250	250	210	8- $\Phi 18$	33
150	400	270	300	285	240	8- $\Phi 22$	38
200	447	287	350	340	295	12- $\Phi 22$	50
250	493	303	450	405	355	12- $\Phi 26$	63
300	543	328	500	460	410	12- $\Phi 26$	80

Notice:

1. The sensor uses flange connection. The flange specifications are shown in Table [Process Connection Options].
2. The sensor can be installed horizontally and vertically. The pipeline has to be full when working.
3. The direction of the water flow in the pipeline must be the same as the arrow indicated on the sensor flowtube.



Installation Dimension and Weight (Split)

Size [mm]	Dimensions [mm]			Flange [mm]			Approx. Weight [kg]
	H2	H3	L	D	K	n-ΦY	
40	218	150	200	150	110	4-Φ18	14
50	271	153	200	165	125	4-Φ18	16
65	247	164	200	185	145	8-Φ18	18
80	264	173	200	200	160	8-Φ18	20
100	280	178	250	220	180	8-Φ18	31
125	304	188	250	250	210	8-Φ18	35
150	333	203	300	285	240	8-Φ22	41
200	380	220	350	340	295	12-Φ22	52
250	426	236	450	405	355	12-Φ26	67
300	477	262	500	460	410	12-Φ26	87

Product Order Structure

NF1 - AAA - BBCDD - EEFF - GGHH - KK

AAA	Size
112	DN40 (1 1/2")
002	DN50 (2")
212	DN65 (2 1/2")
003	DN80 (3")
004	DN100 (4")
005	DN125 (5")
006	DN150 (6")
008	DN200 (8")
010	DN250 (10")
012	DN300 (12")
xxx	Special sizes
BB	Process Connection Type
A1	ANSI B16.5 150#
A2	ANSI B16.5 300#
A3	ANSI B16.5 600#
S1	DIN, EN 1092 PN10
S2	DIN, EN 1092 PN16
S3	DIN, EN 1092 PN25
J1	JIS 5K
J2	JIS 7.5K
J3	JIS 10K
T1	AS 2129 Table D
T2	AS 2129 Table E
F1	AS 4087 PN16
CC	Process Connection Material
01	Carbon steel
02	304 stainless steel
DD	Grounding Rings
00	None
01	304 stainless steel
02	316 stainless steel
EE	Transmitter Type
C1	Integral
R1	Remote
FF	Power Supply
P1	Battery-powered
P2	Battery and external renewable energy
GG	Electrical Output
S1	Pulse /Frequency
S2	4~20 mA current
HH	Communication
00	Bluetooth
01	Bluetooth and GSM
02	Bluetooth and LoRaWan
03	Bluetooth and NB-IoT
KK	Signal Cable Length (remote transmitter only)
L1	5 m
L2	10 m
L3	20 m
L4	30 m
L5	50 m
L6	100 m

Client Name

Contact Info

Client Address

Product Serial No.

NF1- AAA -BBCCDD -EEFF -GGHH -KK

Other Optional Accessories

If you need any of the listed accessories, please tick the box ahead.

	Code	Accessory
<input type="checkbox"/>	NFCA	Communication Adaptors
<input type="checkbox"/>	NFEB	External Battery Pack
<input type="checkbox"/>	NFSP	Solar Package
<input type="checkbox"/>	NFPC	PC Configuration Module
<input type="checkbox"/>	NFCR	4-20 mA Output Module
<input type="checkbox"/>	NFRB	Replacement Kit

Note

Date

***Our Global Based Engineering Team
Are On Hand To Support Sustainability
Challenge***

More retailer contacts details can be found on our website.
www.gflowplus.com



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