


# *NautiFlow NF1* *Electromagnetic Flowmeter* Technical Datasheet

ACCURATE  
RELIABLE  
CONNECTIVITY

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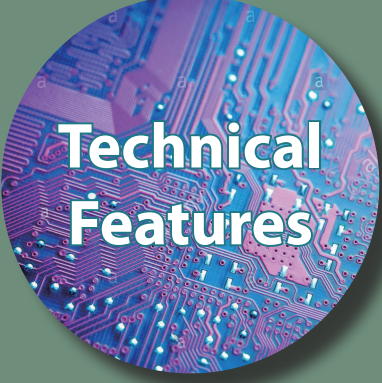


***G**Flow+ has been providing intelligent water and energy metering solution since its foundation in 2012. Led by a group of innovative engineers, gFlow+ focuses on creating entire sustainable and analytical smart metering application system.*

*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 measurement circuitry
- Multiple power modes: Battery, External DC and Renewables
- Tamper-proof for 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 submersible design
- Metrelogy conforming to OIML R49:2013 and ISO 4064:2014



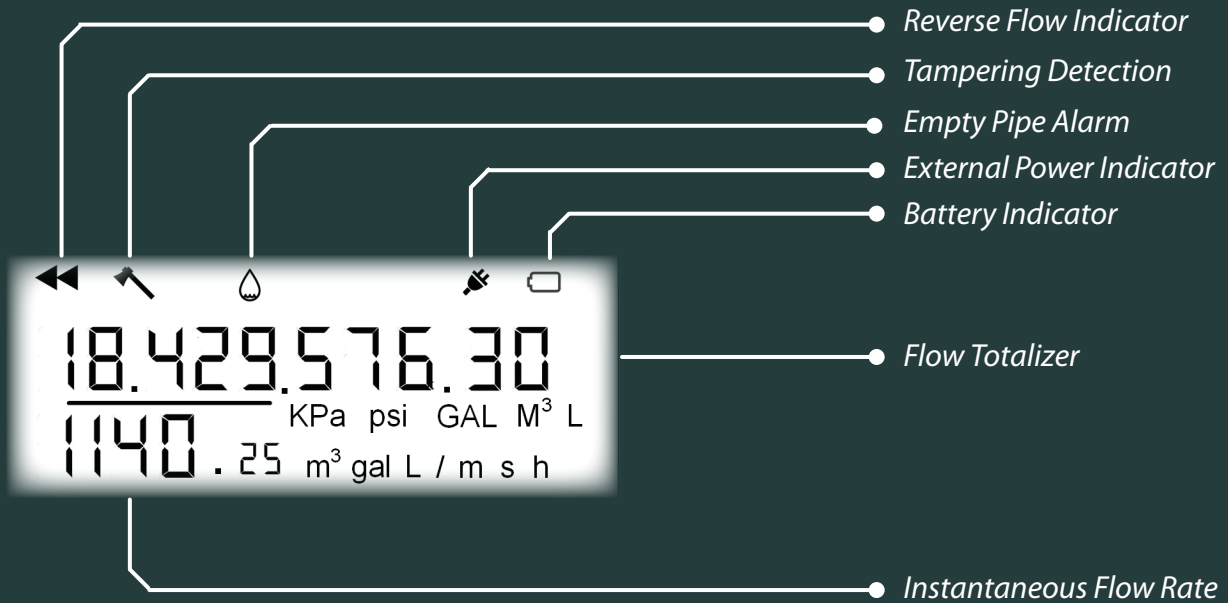
## Application

- Industrial, agricultural and residential water metering
- Automated Meter Reading (AMR) through wireless metering endpoint, transmitting in GPRS, NB-IoT, LoraWan protocols
- District Metering Area (DMA)
- Leakage detection
- Other industrial automation under Pulse and ModBus protocols



## Your Benefits

- Non wetted moving part used, less clogging in the pipe
- MIL-DTL-26482 specified quick coupling connection for easiest wiring work over the meter
- IP68 protection class, reliably handling flooding environment
- Battery lifetime up to 10 years, no power grid required
- UART/Pulse/mA interface compatible to all AMR communication protocols, applicable for most applications



**Non-Hazardous Lining**

Safe for potable water delivery, conforming to WRAS

**IP68, NEMA 6P**

All sensor types and integrated flowmeter are, as standard, inherently submersible thus ensuring suitability for installation in chambers and metering pits that are prone to flooding

**Various Flange Options**

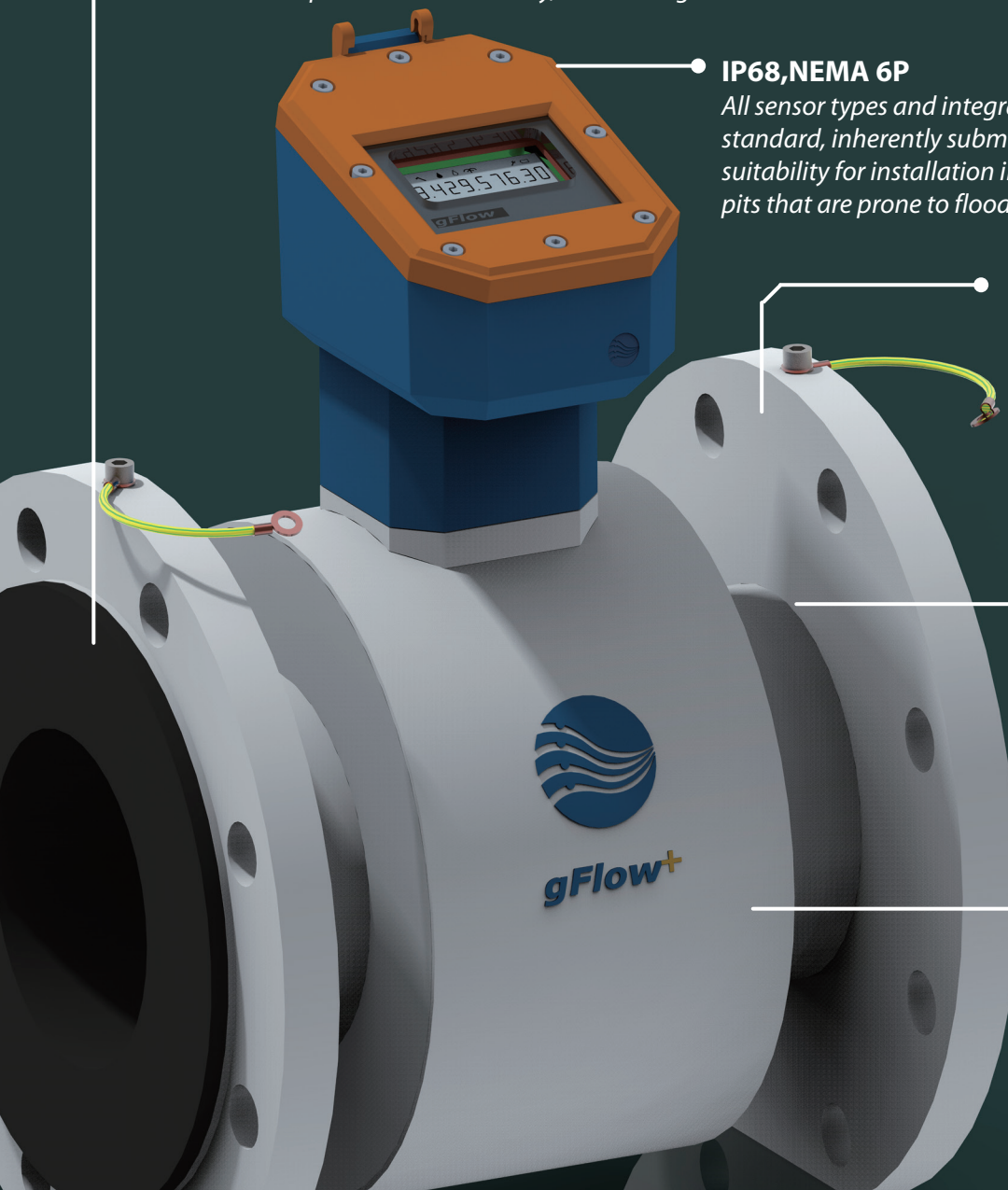
Including ISO7005, DIN, EN1092-1 PN10/ PN16/ PN25 ANSI/ASME B16.5/16.47 Series B Class 150/ Class 300/Class 600 AS 4087 PN16 AS2129 Table D/Table E JIS 5K/7.5K/10K

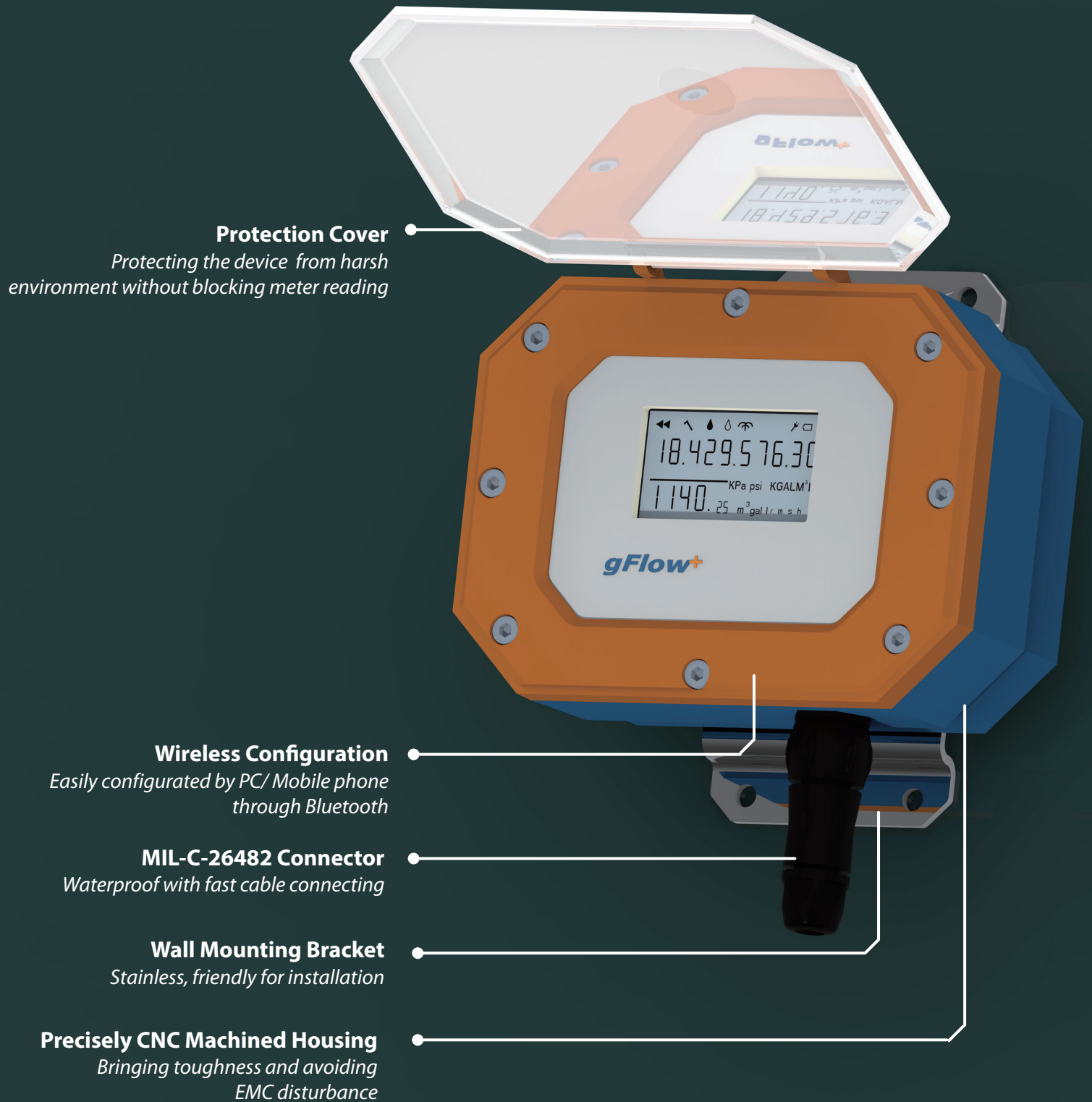
**EN ISO 12944 C4 Grade**

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

**Advanced Sensor Structure Design**

Neither upstream nor downstream pipe required





**Protection Cover**

*Protecting the device from harsh environment without blocking meter reading*

**Wireless Configuration**

*Easily configured by PC/ Mobile phone through Bluetooth*

**MIL-C-26482 Connector**

*Waterproof with fast cable connecting*

**Wall Mounting Bracket**

*Stainless, friendly for installation*

**Precisely CNC Machined Housing**

*Bringing toughness and avoiding EMC disturbance*

# 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 or Class 2 under ISO 4064                                     |
| Repeatability        | ±0.2%   |
| Flowrate Unit        | gal/min, gal/s, L/min, L/s, m <sup>3</sup> /min, m <sup>3</sup> /hour |
| Volume Unit          | gal, kGal, L, kL, m <sup>3</sup> , k m <sup>3</sup>                   |

| 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)                                |
| Physical Media                  | Potable water, industrial water, irrigation water          |
| Min. Conductivity               | 50 µS/cm   |
| Pressure Loss                   | <0.63 bar (detailed information referring to Figure 1)     |
| Inlet Run                       | ≥ 0 DN   |
| Outlet Run                      | ≥ 0 DN   |
| Water Meter Certificate         | OIML R49-2013, WRAS  |
| 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                  |

| 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 (CR, 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

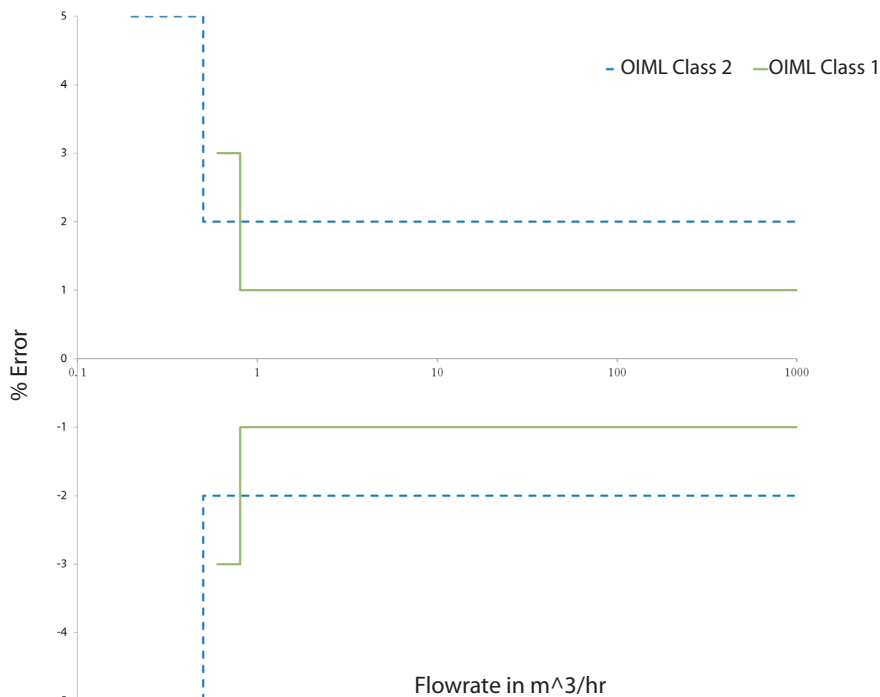
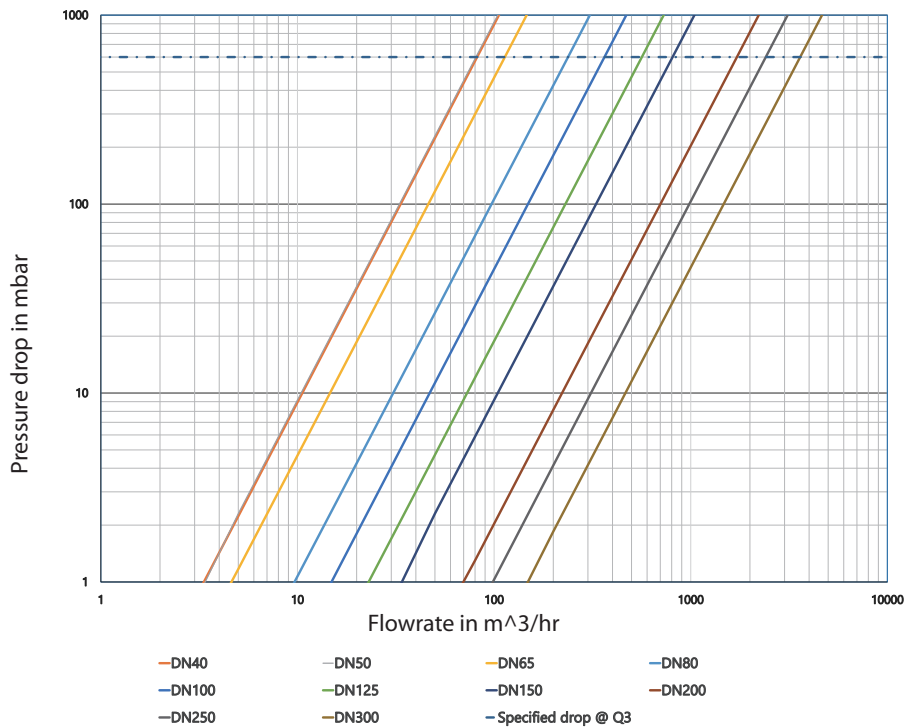
| Electrical Specification |   |
|--------------------------|---|
| <b>Power Supply</b>      |   |
| Internal Battery         | 3.6 V DC, 76 Ah nominal capacity at 20°C, Max. power: 5mW   |
| Battery Life             | 10 years  |
| External Power Input     | 8 to 32 V DC, Max. power: 40 mW   |
| Note                     | 1. A battery to act as backup in case power supply fails<br>2. Max. switch-on surge consumption power: 0.5 W at 24 V DC |
| <b>Output Signal</b>     |   |
| Pulse Output             | Passive, Opto-MOS, breakdown voltage: 30 V DC<br>Isolated from other secondary circuits: 500 V DC                       |
| Output Frequency         | 0-1000 Hz, with adjustable duty cycle   |
| <b>Communication</b>     |   |
| Protocol                 | UART (Isolated from secondary circuits: 500 V DC)   |
| <b>Others</b>            |   |
| Keypad                   | Reed relay for unit switching   |
| Display                  | 128-segment ultra-low-power LCD, wide view angle  |
| Alarm Indicator          | Empty pipe, reverse flow, low battery, tamper detection, external power, burst (user defined), leakage (user defined)   |

| 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 |

| Measurement Range |                         |                         |                         |                         |     |
|-------------------|-------------------------|-------------------------|-------------------------|-------------------------|-----|
| DN (mm)           | Q1 (m <sup>3</sup> / h) | Q2 (m <sup>3</sup> / h) | Q3 (m <sup>3</sup> / h) | Q4 (m <sup>3</sup> / h) | R   |
| 40                | 0.16                    | 0.256                   | 40                      | 50                      | 250 |
| 50                | 0.25                    | 0.4                     | 62.5                    | 78.1                    | 250 |
| 65                | 0.39                    | 0.624                   | 97.5                    | 121.9                   | 250 |
| 80                | 0.63                    | 1.008                   | 157.5                   | 196.9                   | 250 |
| 100               | 1                       | 1.6                     | 250                     | 312.5                   | 250 |
| 125               | 1                       | 1.6                     | 250                     | 312.5                   | 250 |
| 150               | 2.5                     | 4                       | 625                     | 781.3                   | 250 |
| 200               | 3.94                    | 6.304                   | 985                     | 1231.3                  | 250 |
| 250               | 6.25                    | 10                      | 1000                    | 1250                    | 160 |
| 300               | 10                      | 16                      | 1600                    | 2000                    | 160 |

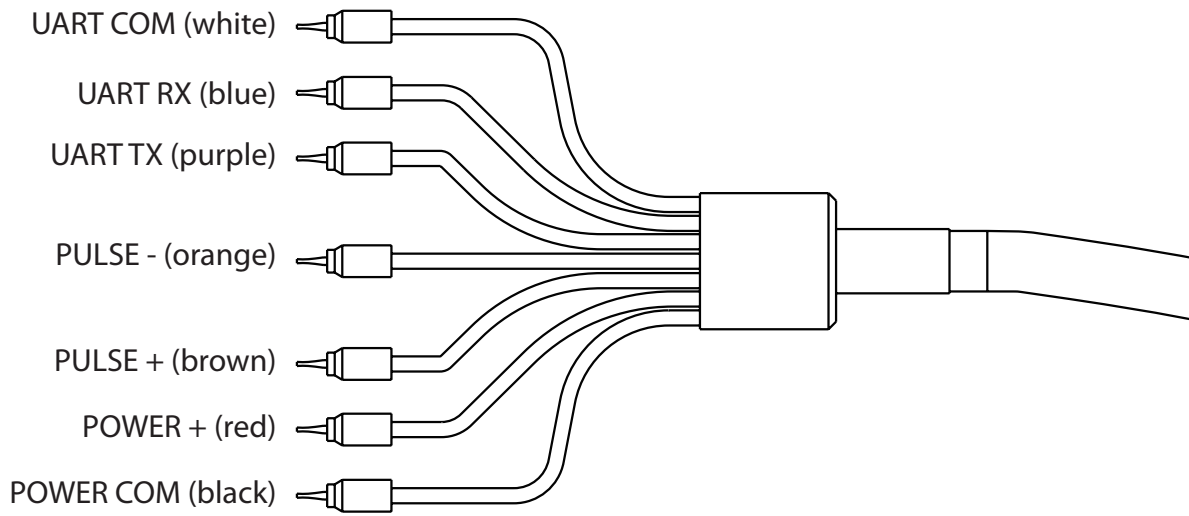
# Technical Data and Specifications

| Optional Accessories   |   |
|------------------------|---|
| Communication Adaptors | Modbus RS-485, RS-232, USB  |
| External Battery Pack  | 76 Ah, life up to 10 years  |
| Solar Package          | 10 W solar power panel with rechargeable Li-batteries   |
| Configuration Module   | Incl. configuration enclosure, 75cm cable from meter to enclosure and 75cm USB cable from enclosure to PC |
| 4~20 mA Output Module  | Converting pulse signal to 4~20 mA output for control system  |
| Replacement Kit        | Incl. 4 x ER34615 high energy battery, O-rings between meter cover and housing, 25g silicon sealant       |

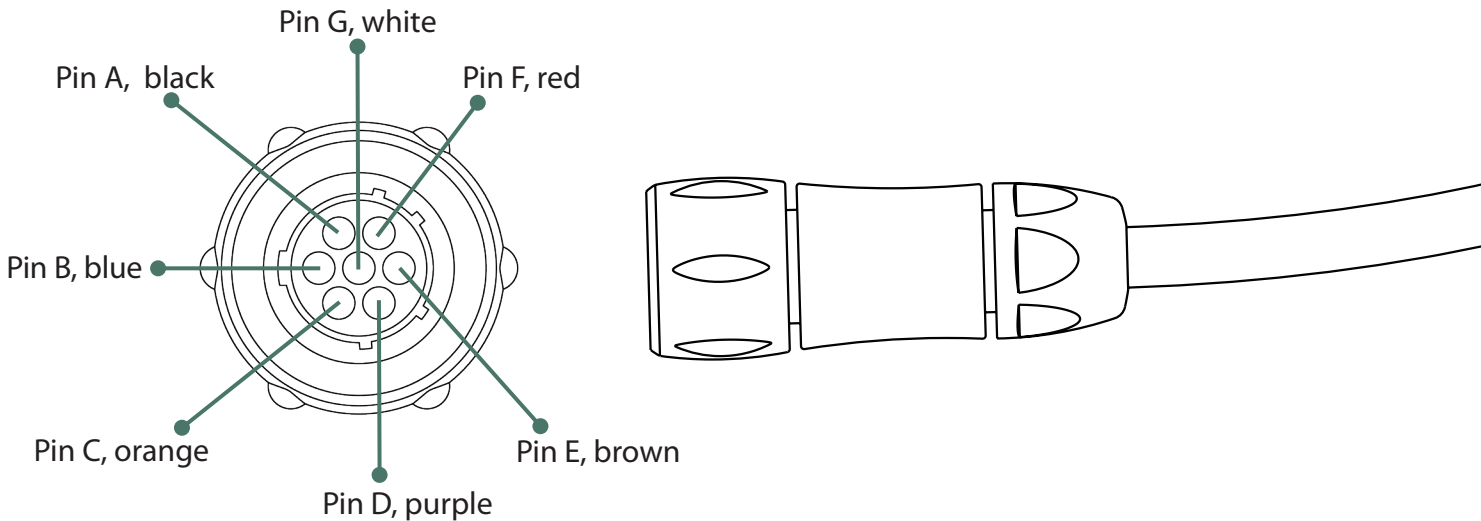




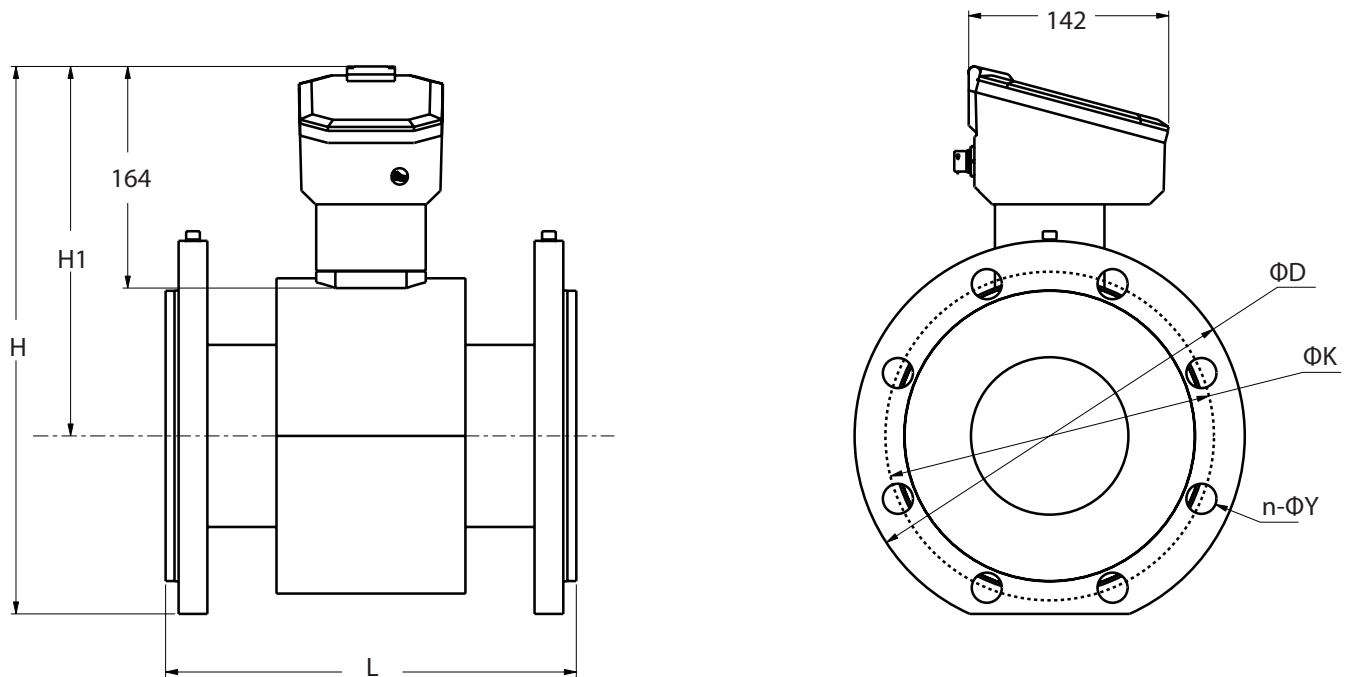
# Technical Data and Specifications



| Pin Definition |  |
|----------------|--|
| UART COM       | Common pin for UART communication  |
| UART RX        | Data receiving pin for UART communication                                  |
| UART TX        | Data sending pin of UART communication (can be configured as pulse output) |
| PULSE -        | Pulse output common pin  |
| PULSE +        | Pulse output positive pin  |
| POWER +        | 8~32 V DC power input  |
| POWER -        | Power grounding pin  |



# Dimensions



**Installation Dimension and Weight (Integrated)**

| Size [mm] | Dimensions [mm] |     |     | Flange [mm] |     |               | Approx. Weight [kg] |
|-----------|-----------------|-----|-----|-------------|-----|---------------|---------------------|
|           | H               | H1  | L   | D           | K   | n- $\Phi Y$   |                     |
| 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                  |

## Product Order Structure

NF1 - AAA - BBCDD - EEFF - GGHH - KK

**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")  
 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

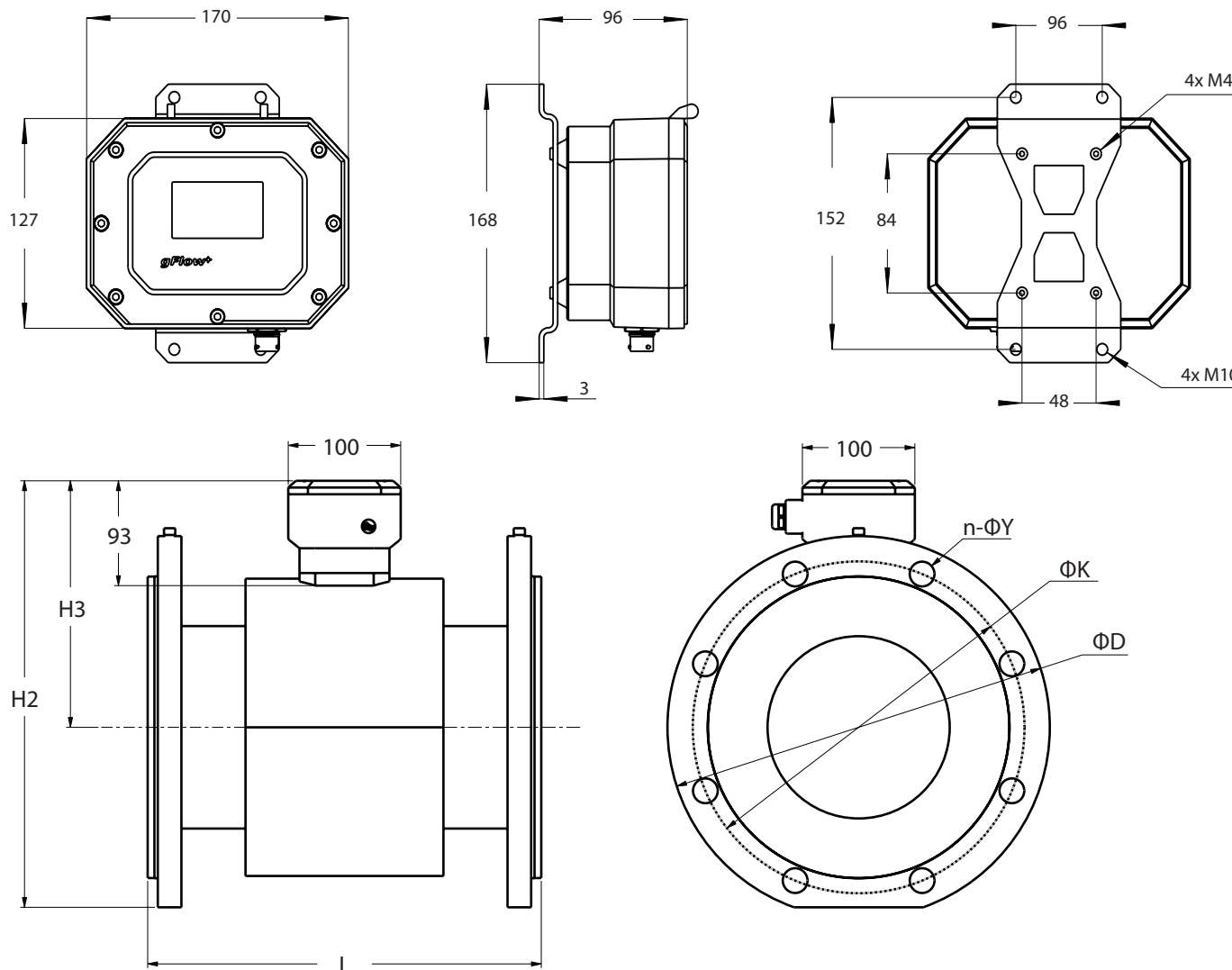
**FF** Power Supply  
 P1 Battery-powered  
 P2 Battery and external renewable energy

**GG** Electrical Output  
 S1 Pulse /Frequency  
 S2 4~20 mA current

**HH** Communication  
 01 UART  
 02 GPRS  
 03 LoraWAN

**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



**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                  |

## Client Name

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## Contact Info

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## Client Address

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## 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

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## Date

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## Your Contacts

Our global team is on hand to solve your water metering problems and will be happy to provide advice.

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