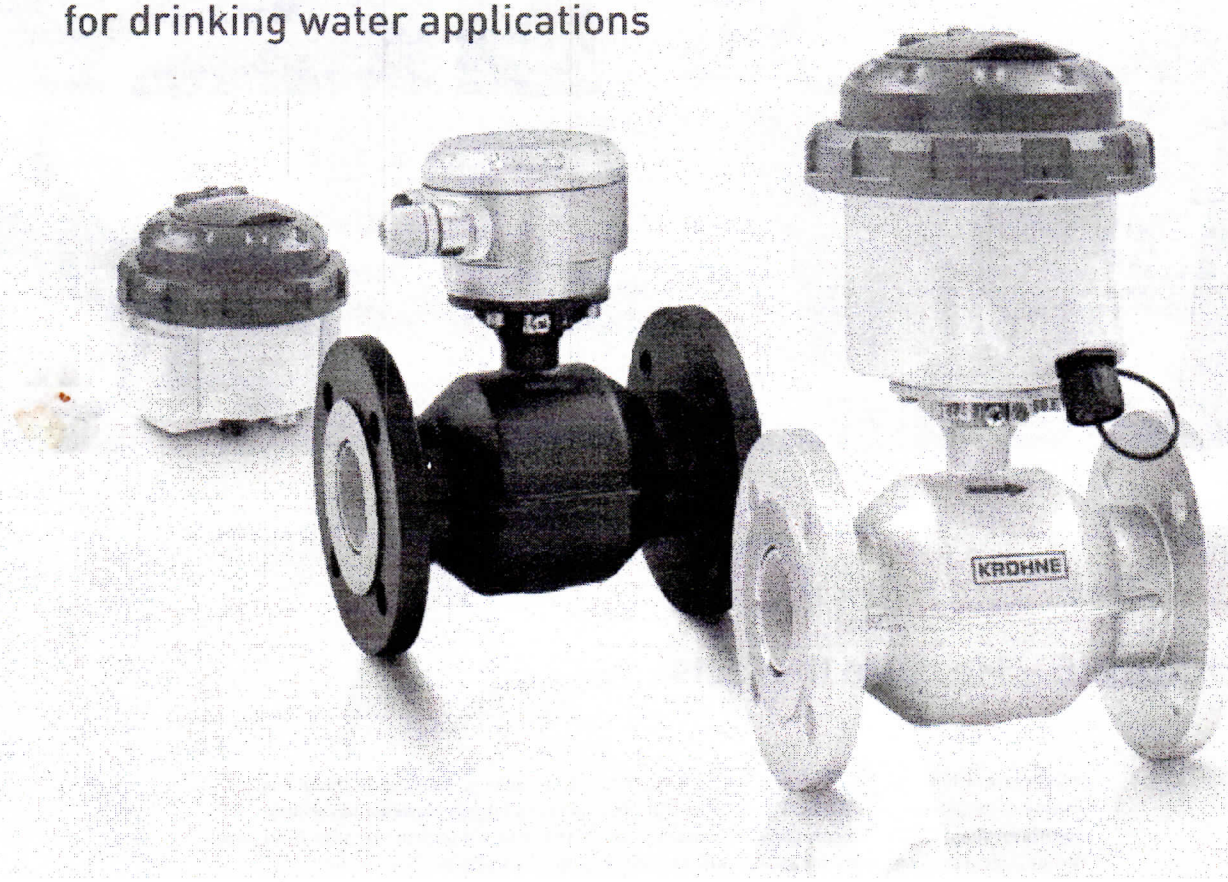
DWS Approved (only)
SCADA Connected

# WATERFLUX 3070

## Electromagnetic water meter for drinking water applications

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measure the facts

- Installation without inlet and outlet sections
- Integrated flow, pressure and temperature measurement
- Communication via Modbus RTU or pulses
- Multiple power concept for any location

# WATERFLUX 3070 –
# High precision, 100% KROHNE innovation

WATERFLUX 3070 is a ground breaking electromagnetic water meter for applications in the field of drinking water.

It is the first **all-in-one device** that measures flow, pressure and temperature in just one instrument. With its unique sensor design featuring reduced cross section and an efficient coil construction, WATERFLUX significantly optimises flow velocity and flow profile, and produces **unprecedented accuracy** under virtually all flow conditions.

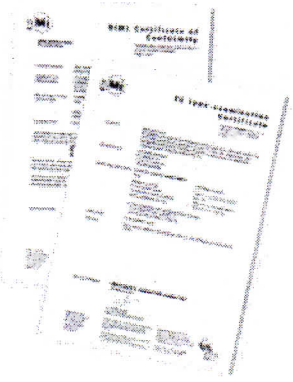
The water meter **does not require inlets and outlets**, enables **extremely low power consumption**, and provides a **highly durable design** without sensitive moving parts in the flow.
WATERFLUX 3070 is the compelling choice for 21st century drinking water management systems.

**Typical applications:**

- Measurement of clean (potable) water
- Distribution networks monitoring
- Maintaining water balance
- Pressure monitoring and water quality control with integrated pressure and temperature sensor
- Pressure and pumping stations
- Water consumption and billing
- Checking or billing of ground water

## Metrology

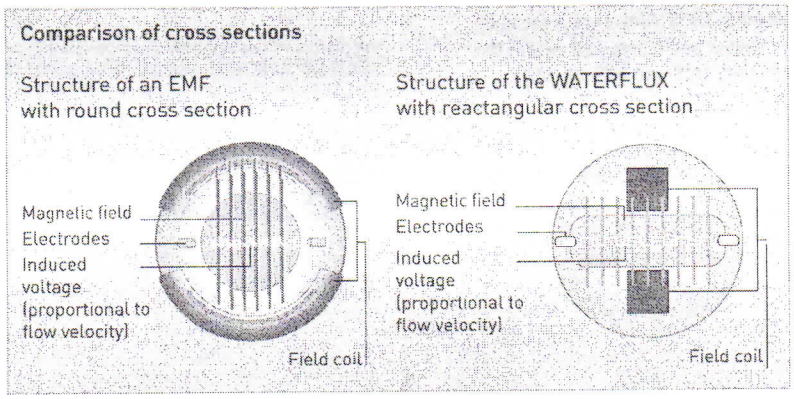
WATERFLUX 3070 is approved to **OIML R49 and MID Annex MI-001** for water meters. The OIML R49 sets out the conditions to which water meters must comply to meet the requirements of the services of legal metrology in countries where these instruments are subject to state controls. The certification applies for **accuracy class 1 and 2**, for the complete diameter range, and fulfils the accuracy requirements **also for installation with 0D inlet and 0D outlet sections**. Access to fiscal parameters can be blocked to prevent intervention of non-authorised persons.

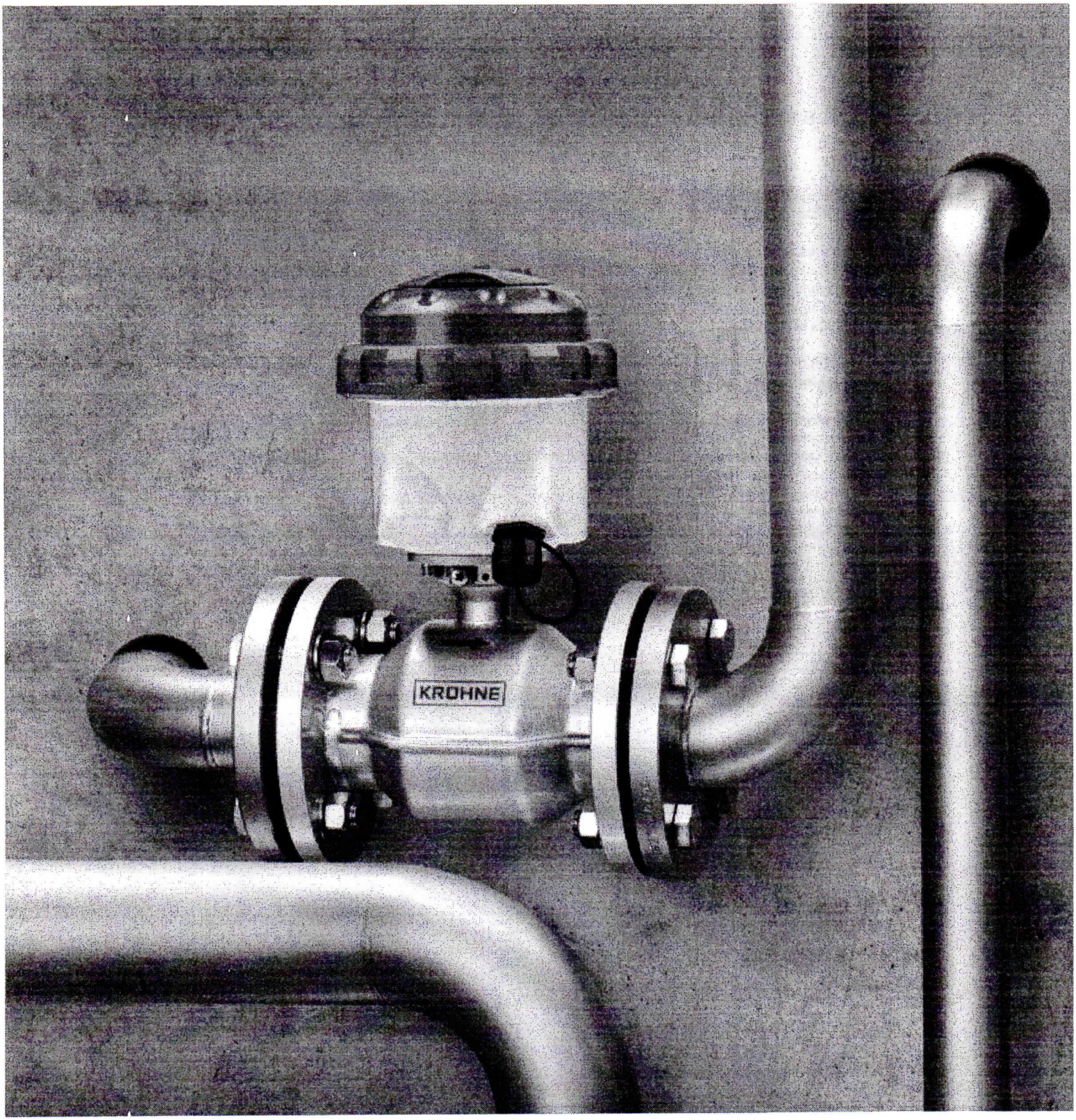


# Unique rectangular bore construction

The strengths of the WATERFLUX 3070 lie in its **unique flow sensor design** with a reduced cross section and an efficient coil construction. Mean flow velocity and flow profile are optimised within the cross section thanks to the rectangular design of the sensor. The measurement is therefore **independent from the flow profile**. The coils provide a stronger, more homogeneous magnetic field, leading to an improved signal-to-noise ratio and **stable measurements**.

The benefits of this design are a **very good low-flow performance**, but also a reduction of the additional uncertainty for upstream disturbances. The WATERFLUX 3000 sensor can therefore be installed with zero inlet and outlet lengths. Another major benefit of the rectangular sensor is its very low power consumption, leading to a **long battery lifetime**.

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## Installation in measurement chambers

Water meters are used for monitoring and control purposes in the water distribution networks running from the water production plant down to the customer. The meters are often installed in measurement chambers under ground.

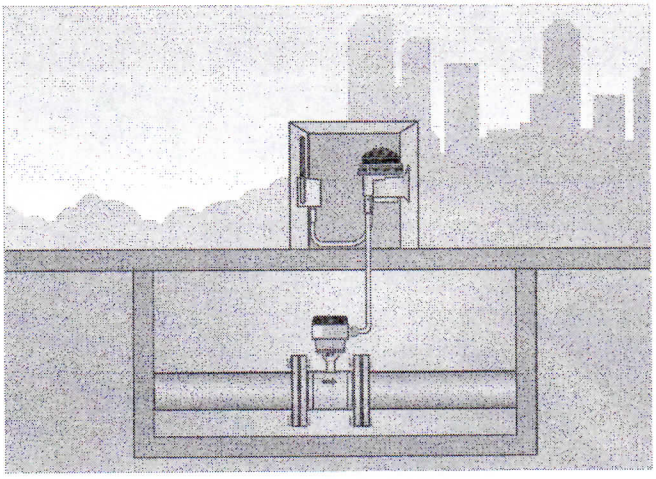
The installation of a WATERFLUX 3070 has some major benefits compared to a mechanical meter because it **does not need upstream and downstream piping** but also **no ancillary equipment** like strainers, filters or isolation valves with a bypass.

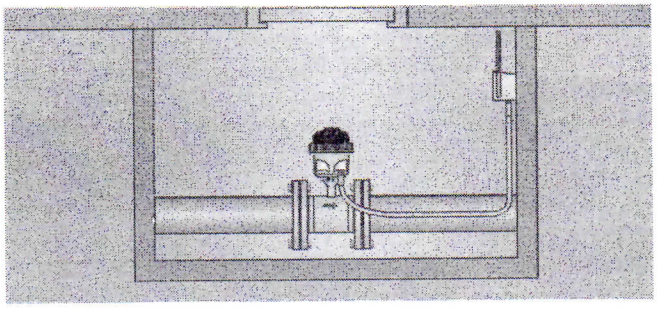
All that is required in the measurement chamber is the sensor itself leading to substantial lower installation costs. A (compact or remote) signal converter and an optional data logger/GPRS unit can be installed either in the measurement chamber or above the ground. Above the ground the remote signal converter and datalogger/GPRS unit are usually placed on a pillar or in an electrical cabinet.

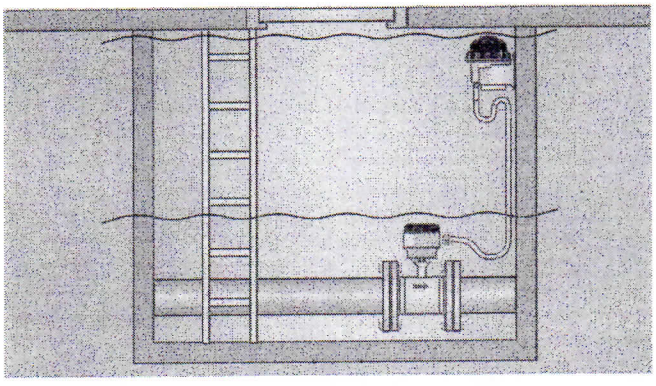
With its **maintenance-free design** also substantial reductions in maintenance costs can be realised. There is **no need for removing the sensor from the line for a recalibration**. The OPTICHECK is available for verifying the integrity of the flow sensor, transmitter and transmitter cable.

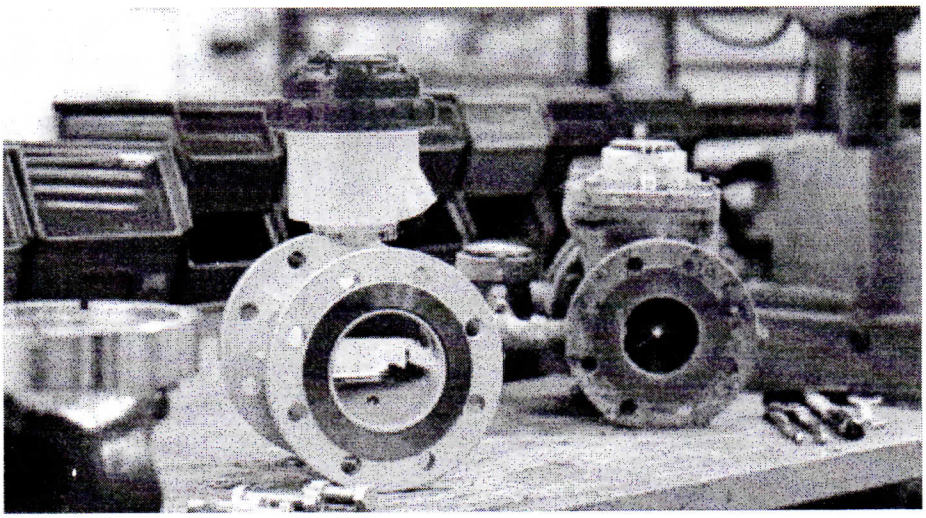
## Immersion in water (IP68)

As standard the robust WATERFLUX 3000 flow sensor with a stainless steel connection box is **suitable for long-duration immersion** in flooded metering pits, for example in periods of heavy rainfall. Both the compact and remote version of the IFC 070 signal converter allow for installation in measurement chambers with periodic immersion in water. Immersion in water is possible **down to a depth of 10 metres**. The WATERFLUX sensor and signal converter are **IP68** rated according to EN-IEC 60529.









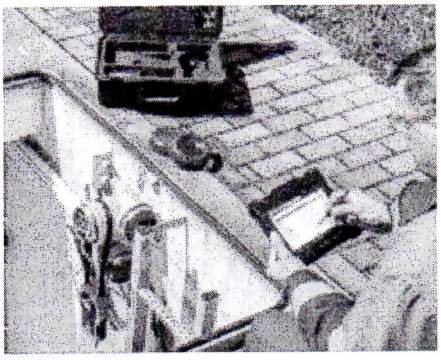
# Long-term reliability

In a world where water is becoming scarce, potable water is a precious resource. Flow measurements of potable water need to be very accurate as they form the basis for efficient water network management and for the billing of water consumption.

Every single flowmeter is **standard wet calibrated** before leaving the factory. As an option **verification to custody transfer** standards (OIML R49, MI-001) can also be ordered. KROHNE operates a large number of accurate calibration facilities including the **world's most precise volumetric calibration rig** for flowmeters.

Thanks to its **unobstructed measuring section**, the WATERFLUX sensor is far superior to conventional mechanical water meters, in terms of pressure loss and long-term stability. The WATERFLUX 3070 performs **automatic self-tests** including an of integrity check of hardware and software and a calculation of the remaining battery lifetime. If required, warnings and error messages are available on the display, via the status outputs or via Modbus.

The **OPTICHECK** provides an **inline health check** to make sure that installed electromagnetic flowmeters are performing within specification. When the tool is connected on site, it gathers measuring data to ensure that the flowmeter is performing within 1% of its factory calibration. A **hard copy verification report** can be printed for every flowmeter. **Contact KROHNE for more information or for an onsite service visit.**



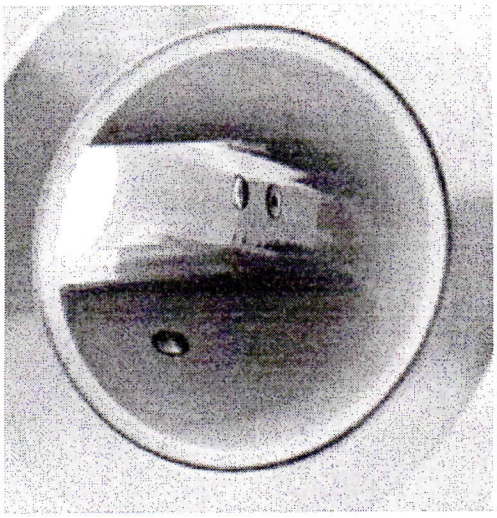
# Flow, pressure and temperature measurement with just one device

Maintaining the water balance, reducing pumping costs, pressure monitoring and district zoning (DMA) are focus areas for water companies in drinking water distribution networks. Pressure and flow data give **important input for monitoring and operating networks**. Managing pressure levels is required for efficient transport and delivery of potable water. A large pressure drop is an indicator for leakage.

Safety of drinking water is a key priority for water companies. Temperature control is required because high temperatures may pose a risk to public health and flushing of networks is needed. When potable water has reached a critical value, the WATERFLUX 3070 sounds an alarm.

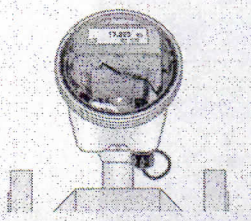
WATERFLUX 3070 is the first all-in-one water meter that measures **flow, pressure and temperature simultaneously** with just one instrument. The WATERFLUX 3000 sensor is equipped with an **integrated pressure and temperature sensor**.

- Flow, pressure and temperature measurement values can be read on the IFC 070 display and can be read out via Modbus RTU
- An alarm can be generated via the status output or via Modbus when critical limits for pressure and/or temperature are exceeded

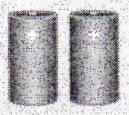


## Standard

WATERFLUX 3070 with internal battery power



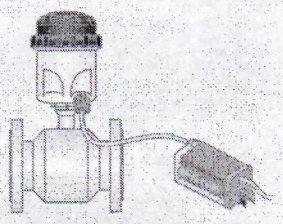
Battery power



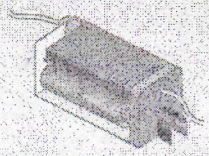
Lithium double D-cell

## Option 1

WATERFLUX 3070 with external battery PowerBlock



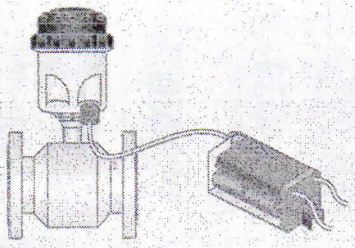
External battery PowerBlock



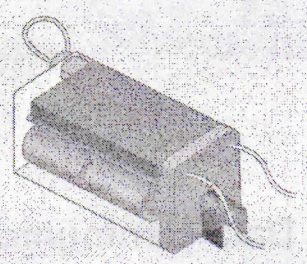
Lithium double DD-cell

## Option 2

WATERFLUX 3070 with FlexPower unit



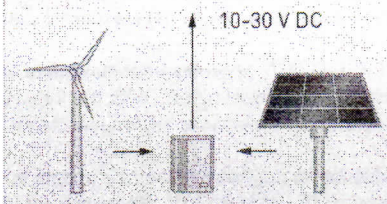
FlexPower unit



Mains power with battery backup (lithium double D-cell)

Power source

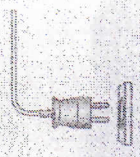
10-30 V DC



DC distribution box

Power source

100-230 V AC



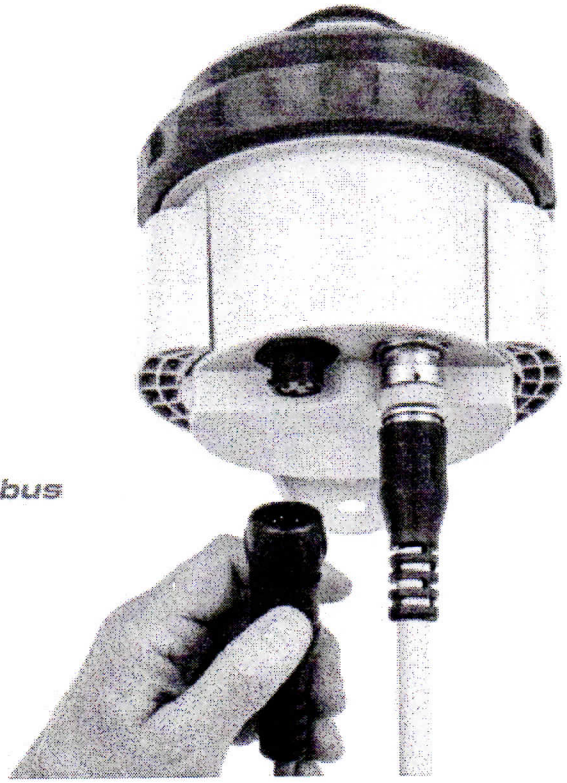
## Modbus communication

WATERFLUX 3070 can communicate by RS485 using the Modbus RTU protocol. An add-on board for the **Modbus module is integrated** in the IP68 converter housing. Modbus has been selected because it is a mature, versatile and accepted protocol and can be easily integrated into other communication systems. It forms a standard solution to disclose all data available from the IFC 070 signal converter.

WATERFLUX 3070 **offers two RS 485 Modbus RTU interface options**: a low (battery) power and a high (mains) power Modbus option. The **low power** (non-isolated) Modbus version is unique in the market and can be used for data communication between a battery-powered WATERFLUX 3070 version and a battery-powered data logger GPRS module. In the case of the WATERFLUX 3070 with FlexPower, the mains powered water meter, the **high power** (isolated) Modbus option can be ordered for data communication to process automation systems (SCADA, DCS, PLC).

## Modbus options

| | Battery power | FlexPower (mains power) |
|---|---|---|
| Communication | • 2 pulse + 2 status outputs<br>• Optional low power Modbus communication for connection to GSM/GPRS module | • 2 pulse + 2 status outputs<br>• High power Modbus communication for connection to e.g. PLC |

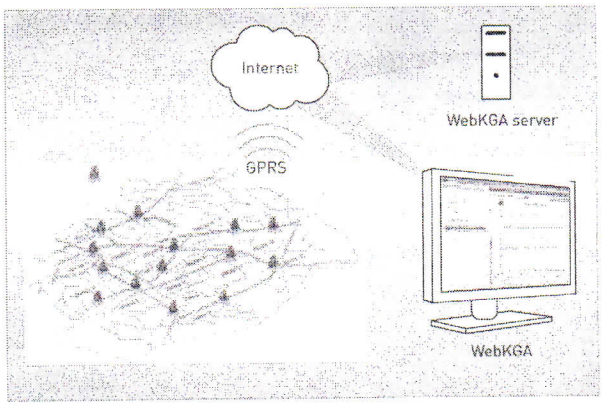


## Web-based data hosting

Through a dedicated web site, **data can be viewed or exported** for further analysis. The advantages are: a fully secured data base and confidential access to data, no more constraints to handle a SCADA and data presentation can be customised by the end user. Additionally, PC-based data hosting can be used.

A **wide range of collected data** are available, e.g.:

- Trend curves with statistics and printing
- List of data (counters, flow, daily/weekly/monthly reports, measurements, alarms, etc.)
- Data exported in Excel
- automatic alarms to be sent to a dedicated e-mail address
- Data can be sent to a dedicated FTP server




| | IFC 050 | IFC 100 | IFC 300 | IFC 070 |
|---|---|---|---|---|
| |  |  |  |  |
| Housing variants | Compact, Wall | Compact, Wall | Compact, Wall, Rack, Field | Compact, Field |
| Protection category | IP66/67 | IP66/67 | IP66/67 | IP68 |
| Mains power | 100...230 VAC<br>24 VDC | 100...230 VAC<br>12-24 VDC<br>24 VAC/DC | 100...230 VAC<br>12-24 VDC<br>24 VAC/DC | 110...230 VAC<br>10...30 VDC |
| Battery backup | - | - | - | yes |
| Battery power | - | - | - | internal or external |
| Measurement accuracy | ±0.5% of MV above 0.5 m/s<br>±2.5 mm/s for 0.5 m/s | ±0.3% of MV ±1 mm/s | ±0.2% of MV ±1 mm/s | ±0.2% of MV ±1 mm/s (*)<br>±0.4% of MV ±1 mm/s (**) |
| OIMLR49, MI-001 certification | - | - | yes | yes |
| Outputs | current (active)<br>pulse (active)<br>status/limit switch | current (passive)<br>pulse (passive)<br>status/limit switch | current (active)<br>pulse (active)<br>status/limit switch | -<br>pulse (passive)<br>status/limit switch |
| Control inputs | - | yes | yes | - |
| Communication | HART®<br>Modbus | HART®<br>Modbus<br>Profibus PA /DP<br>Fieldbus | HART®<br>Modbus<br>Profibus PA /DP<br>Fieldbus | Modbus |
| Primary measurement | flow rate<br>($m^3/h$) | flow rate<br>($m^3/h$) | flow rate<br>($m^3/h$) | flow counter<br>($m^3$) |
| Secondary/ optional measurement | - | - | - | flow rate, pressure, temperature |

(*) DN25-300, (**) DN350-600

# Technical data

| | |
|---|---|
| Sensor construction | Unique rectangular flow sensor design for DN25 to DN600; 1"to 12"<br>Built-in reference electrode |
| Pressure and temperature sensor | Optional: built-in for DN50...200 with compact and remote versions |
| Measuring accuracy | • DN25...300; 1...12" down to 0.2% of the measured value ±1 mm/s (*)<br>• DN350...600; 14...24" down to 0.4% of the measured value ±1 mm/s (*) |
| Power supply | • 2 internal batteries: Dual D-cell (lithium, 3.6 V, 38 Ah)<br>• External battery pack (PowerBlock): Dual DD-cell (lithium, 3.6 V, 70 Ah)<br>• FlexPower unit for mains power incl. battery backup<br>(Dual D-cell lithium, 3.6 V, 38 Ah): 110...230 V AC; 9...30 V DC/50-60 Hz |
| Outputs | • 2 passive pulse outputs<br>• 2 passive status outputs (one status output can be used as a third pulse output) |
| Communication | • Version with internal or external batteries:<br>Passive pulses or non-galvanic separated (low power) Modbus<br>• Version with FlexPower unit:<br>Passive pulses or galvanic separated (high power) Modbus |
| Process connections | • Flanges: EN1092-1, ASME, JIS, AS 4087, AS2129<br>• Threads: DN25 (G1) and DN40 (G1.5) |
| Wetted materials | • Coating: Rilsan® polymer<br>• Electrodes: Stainless steel, Hastelloy® C (option) |
| Sensor material | • Housing: Sheet steel<br>• Connection box: Stainless steel (IP68) |
| Material converter housing | Polycarbonate |
| Custody transfer approvals | OIML R49, MID MI-001<br>Contact KROHNE for national approvals |
| Potable water approvals | ACS, DVGW W270, NSF / ANSI Standard 61, TZW, WRAS |

(*) The specified measurement accuracy refers to use with 3D inlet and 1D outlet