



## **WATERFLUX 3070** Quick Start

Battery powered electromagnetic water meter with optional KROHNE FlexPower

Electronic Revision 5.1.0\_  
(SW.REV.5.1.0\_)

<b>1</b>	<b>Safety instructions</b>	<b>4</b>
<hr/>		
1.1	Instruction for transportation and handling of batteries.....	5
<b>2</b>	<b>Installation</b>	<b>6</b>
<hr/>		
2.1	Scope of delivery.....	6
2.2	Device description .....	7
2.3	Nameplate (example) .....	8
2.4	Storage .....	9
2.5	Transport .....	9
2.6	Pre-installation requirements .....	9
2.7	General requirements .....	10
2.7.1	Vibration .....	10
2.7.2	Magnetic field.....	10
2.8	Installation conditions .....	11
2.8.1	Inlet and outlet .....	11
2.8.2	T-section .....	11
2.8.3	Open feed or discharge .....	11
2.8.4	Bends .....	12
2.8.5	Pump .....	13
2.8.6	Control valve .....	13
2.8.7	Air venting and vacuum forces .....	14
2.8.8	Flange Deviation .....	15
2.8.9	Mounting position.....	15
2.8.10	Installation in a metering pit and subsurface applications.....	16
2.9	Mounting .....	17
2.9.1	Torques and pressures.....	17
2.10	Mounting of the signal converter .....	20
2.10.1	Remote signal converter housing.....	20
2.10.2	Closing of the signal converter housing .....	20
2.10.3	Mounting of the KROHNE FlexPower unit.....	21
<b>3</b>	<b>Electrical connections</b>	<b>22</b>
<hr/>		
3.1	Safety instructions.....	22
3.2	Grounding .....	22
3.3	Cable overview.....	23
3.4	Connection of the flow sensor cable .....	24
3.5	Connection of the signal cable .....	25
3.5.1	IP68 housing (compact version).....	25
3.5.2	IP68 housing (remote version).....	26

4 Start-up	28
4.1 Types of batteries .....	28
4.2 Connecting the internal battery .....	29
4.3 Connecting the external battery.....	30
4.3.1 Battery settings.....	30
4.3.2 IP68 housing (compact and remote version).....	30
4.4 Power supply - battery .....	30
4.5 Power supply - KROHNE FlexPower.....	31
4.5.1 Connection of the FlexPower unit .....	32
5 Technical data	34
5.1 Dimensions and weights .....	34
6 Notes	37

**Warnings and symbols used****DANGER!**

*This information refers to the immediate danger when working with electricity.*

**DANGER!**

*These warnings must be observed without fail. Even partial disregard of this warning can lead to serious health problems and even death. There is also the risk of seriously damaging the device or parts of the operator's plant.*

**WARNING!**

*Disregarding this safety warning, even if only in part, poses the risk of serious health problems. There is also the risk of damaging the device or parts of the operator's plant.*

**CAUTION!**

*Disregarding these instructions can result in damage to the device or to parts of the operator's plant.*

**INFORMATION!**

*These instructions contain important information for the handling of the device.*

**HANDLING**

- This symbol designates all instructions for actions to be carried out by the operator in the specified sequence.

**RESULT**

This symbol refers to all important consequences of the previous actions.

**Safety instructions for the operator****CAUTION!**

*Installation, assembly, start-up and maintenance may only be performed by appropriately trained personnel. The regional occupational health and safety directives must always be observed.*

**LEGAL NOTICE!**

*The responsibility as to the suitability and intended use of this device rests solely with the user. The supplier assumes no responsibility in the event of improper use by the customer. Improper installation and operation may lead to loss of warranty. In addition, the "Terms and Conditions of Sale" apply which form the basis of the purchase contract.*

**INFORMATION!**

- *Further information can be found in the manual, on the data sheet, in special manuals, certificates and on the manufacturer's website.*
- *If you need to return the device to the manufacturer or supplier, please fill out the form contained in the manual and send it with the device. Unfortunately, the manufacturer cannot repair or inspect the device without the completed form.*

## 1.1 Instruction for transportation and handling of batteries

**WARNING!**

*Lithium batteries are primary power sources with high energy content. If mistreated, they may present a potential risk.*

**INFORMATION!**

*The lithium batteries supplied, are **non-rechargeable**. Do NOT recharge the empty lithium batteries. Dispose of them according to the local legislation in your country.*

**INFORMATION!**

*The manufacturer assumes no liability for customer failure.*

**Please observe the following instructions:**

- Transport only in special packaging with special labels and transportation documents.
- Do not short-circuit, recharge, overcharge or connect with false polarity.
- Do not expose to temperature beyond the specified temperature range or incinerate the battery.
- Do not crush, puncture or open cells or disassemble battery packs.
- Do not weld or solder to the body of the battery.
- Do not expose contents of battery to water.
- Remove the battery from device before returning to the manufacturer for service or warranty reasons.
- Dispose battery packs in accordance with local regulations; where possible, recycle used batteries.

## 2.1 Scope of delivery



### **INFORMATION!**

Do a check of the packing list to make sure that you have all the elements given in the order.



### **INFORMATION!**

Inspect the packaging carefully for damages or signs of rough handling. Report damage to the carrier and to the local office of the manufacturer.



### **INFORMATION!**

The remote version will arrive in two cartons. One carton contains the signal converter and one carton contains the flow sensor.

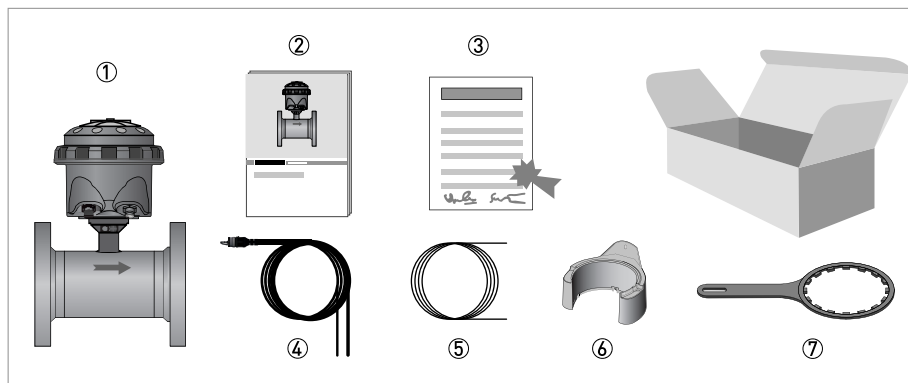


Figure 2-1: Scope of delivery

- ① Ordered water meter (compact or remote version)
- ② Product documentation
- ③ Factory calibration report
- ④ Combined signal/power cable (delivered according order)
- ⑤ Sensor cable (remote version)
- ⑥ Wall holder (remote version)
- ⑦ Special wrench for loosening the locking ring of the cover



### **INFORMATION!**

Assembly materials and tools are not part of the delivery. Use the assembly materials and tools in compliance with the applicable occupational health and safety directives.



### **INFORMATION!**

Special cable and/or cable assemblies are delivered according to the ordered signal converter type.



### **INFORMATION!**

The signal converter housing is delivered with attached IP67 dust caps to protect the connections of the signal converter. After removing the caps and connecting the signal- and sensor cables, the signal converter housing and connections are IP68 rated.

## 2.2 Device description

Your measuring device is supplied ready for operation. The factory settings for the operating data have been made in accordance with your order specifications.



### **INFORMATION!**

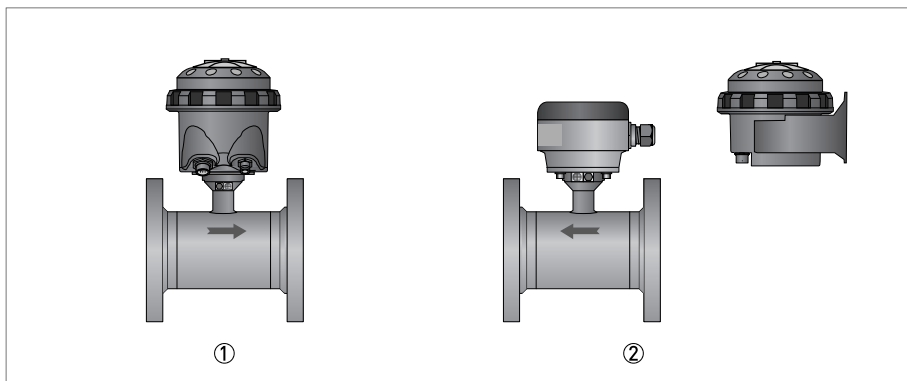
Product specific information and extensive product specification is available using PICK, the Product Information Center KROHNE web-tool.



PICK can be found via the service menu button on the KROHNE.com website.

### **The following versions are available:**

- Compact version (the signal converter is mounted directly on the measuring sensor) in polycarbonate (IP68) housing
- Remote version (measuring sensor with a stainless steel connection box and a signal converter) in a remote, polycarbonate housing



**Figure 2-2: Device versions**

- ① Compact version
- ② Remote version

Both versions are available with an optional integrated P&T sensor.

## 2.3 Nameplate (example)

**INFORMATION!**

Check the device nameplate to ensure that the device is delivered according to your order.

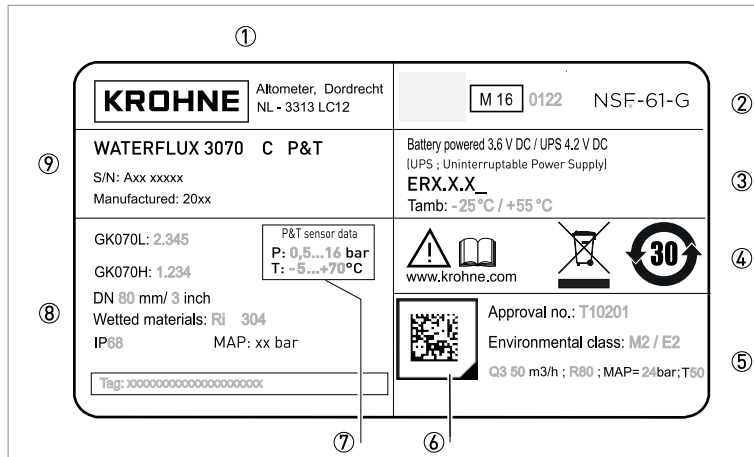


Figure 2-3: Example of nameplate

- ① Name and address of the manufacturer
- ② Comformity mark (e.g. CE/UKCA) with number(s) of notified body/bodies and additional certifications
- ③ Battery voltage UPS and Electronic Revision number
- ④ Disposal logo and supplier website
- ⑤ Optional (MI-001): Approval number, environmental info and metrology data
- ⑥ Data matrix
- ⑦ Specific pressure and temperature data
- ⑧ Meter constant, diameter, wetted materials, protection class
- ⑨ Type designation of the flowmeter, serial number, date of manufacturing  
[option: text P&T only for versions with integrated pressure and temperature sensor]



## 2.4 Storage

- Store the device in a dry, dust-free location.
- Avoid continuous direct sunlight.
- Store the device in its original packaging.
- Storage temperature: -30...+70°C / -22...+158°F

## 2.5 Transport

### Signal converter

- No special requirements.

### Compact version

- Do not lift the device by the signal converter housing.
- Do not use lifting chains.
- To transport flange devices, use lifting straps. Wrap these around both process connections.

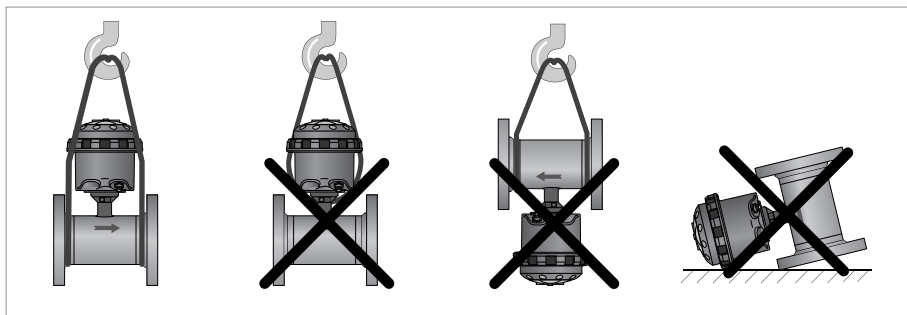


Figure 2-4: Transport

## 2.6 Pre-installation requirements

### Make sure that you have all necessary tools available:

- Allen key (4 mm)
- Small screwdriver
- Wrench for cable glands (remote version only)
- Wrench for wall mounting bracket (remote version only)
- Torque wrench for installing flowmeter in pipeline

## 2.7 General requirements



### INFORMATION!

The following precautions must be taken to ensure reliable installation.

- Make sure that there is adequate space to the sides.
- Protect the signal converter from direct sunlight and install a sun shade if necessary.
- Signal converters installed in control cabinets require adequate cooling, e.g. by fan or heat exchanger.
- Do not expose the signal converter to intense vibrations and mechanical shocks. The measuring devices are tested for a vibration/shock level as described in the chapter "Technical data" in the manual and the technical documentation.
- Avoid magnetic field! Keep at least 5 DN distance between electromagnetic flow sensors.

### 2.7.1 Vibration

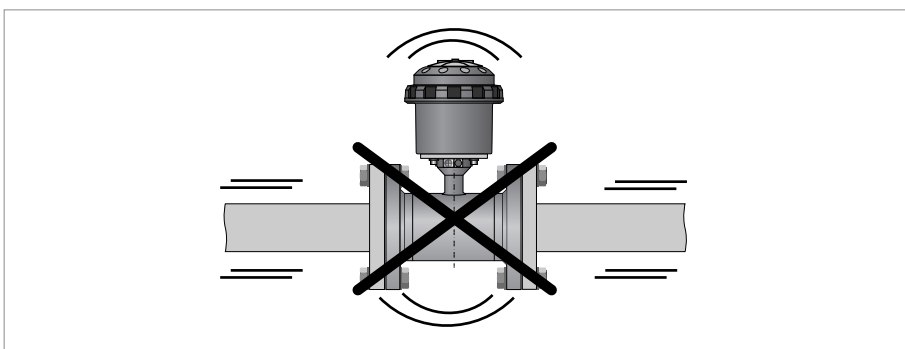


Figure 2-5: Avoid vibrations

### 2.7.2 Magnetic field

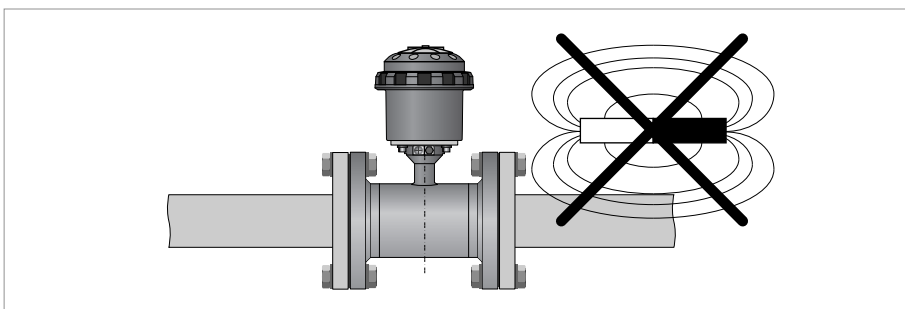


Figure 2-6: Avoid magnetic fields

## 2.8 Installation conditions



### CAUTION!

To prevent damage to the Rilsan® coating, the WATERFLUX 3000 flow sensor must be installed carefully. Take precautions during transport and installation to protect the in- and outlet of the flow sensor.

### 2.8.1 Inlet and outlet

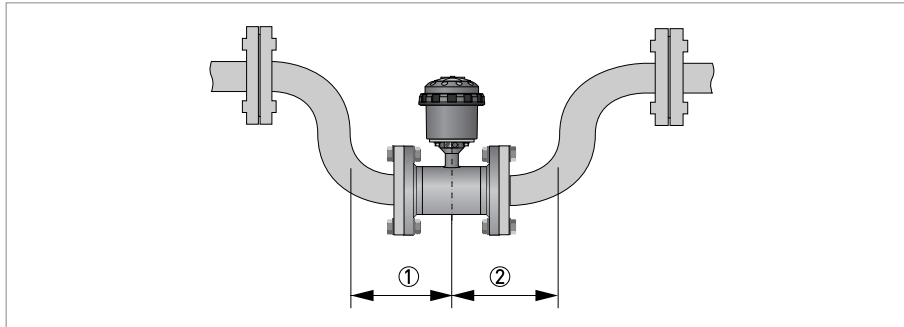


Figure 2-7: Minimal inlet and outlet

- ① Inlet:  $\geq 0$  DN
- ② Outlet:  $\geq 0$  DN

### 2.8.2 T-section

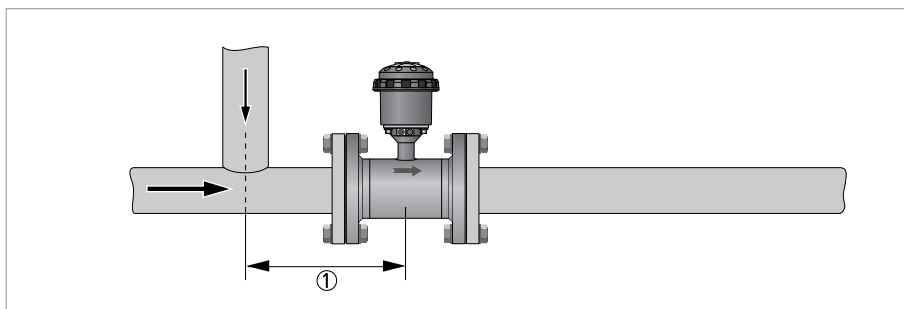


Figure 2-8: Distance behind a T-section

- ①  $\geq 0$  DN

### 2.8.3 Open feed or discharge

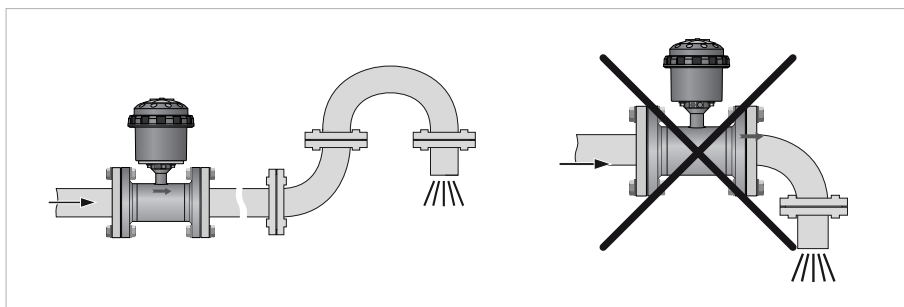


Figure 2-9: Installation in front of an open discharge

## 2.8.4 Bends

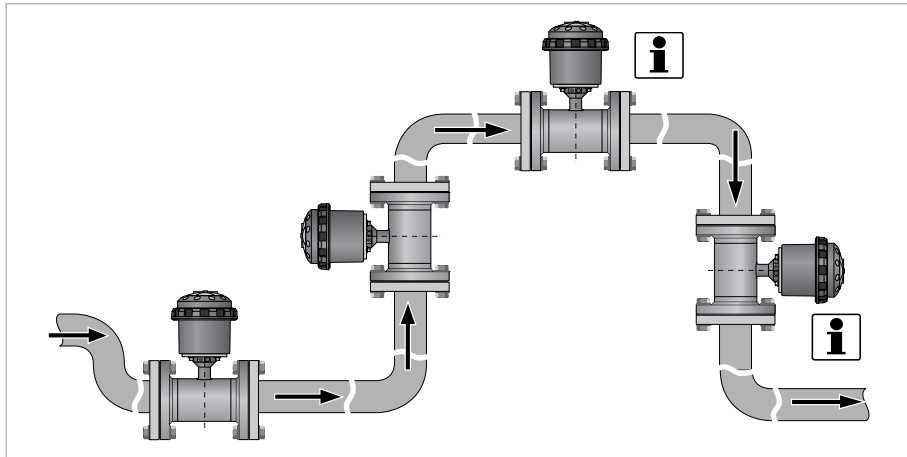


Figure 2-10: Installation in bending pipes (90°)

**INFORMATION!**

Recommended installation positions are at a lowered or ascending section of the pipeline installation. Installation at the highest point will enlarge the risk of flowmeter malfunction, because of air/gas bubbles.

Vertical installation in combination with an open discharge has to be avoided.

Vertical installation with a controlled back-pressure is possible.

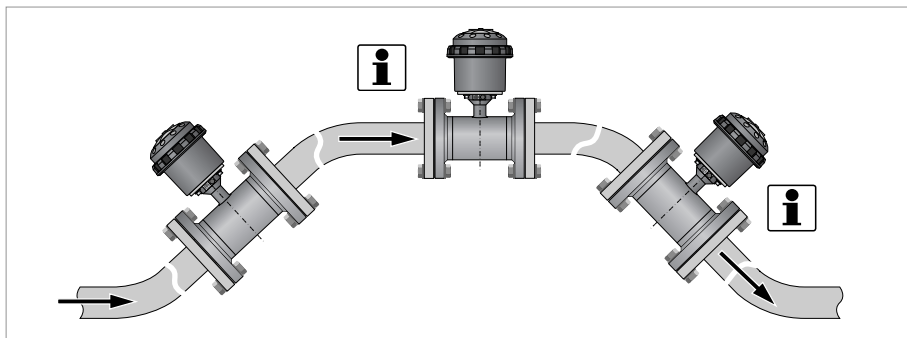


Figure 2-11: Installation in bending pipes (45°)

**CAUTION!**

Avoid draining or partial filling of the flow sensor.

**INFORMATION!**

Vertical installation on a descending slope in the pipeline is only recommended when the back-pressure is controlled.

## 2.8.5 Pump

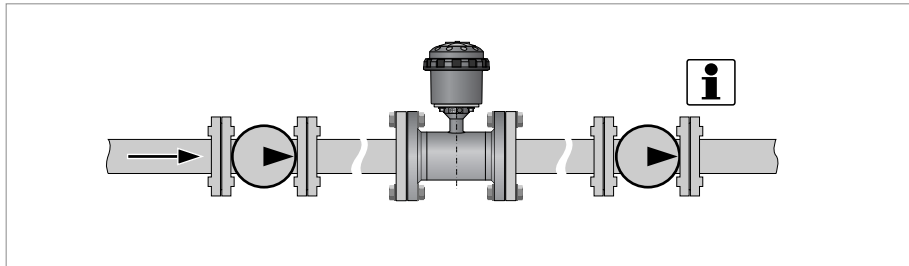


Figure 2-12: Recommended installation: behind a pump



### **INFORMATION!**

Recommended position to install a flowmeter is downstream a pump (on a position where the flow disturbances of the pump are resolved).

An electromagnetic flowmeter can be installed in the suction line of a pump if there is no cavitation in the pipeline system.

## 2.8.6 Control valve

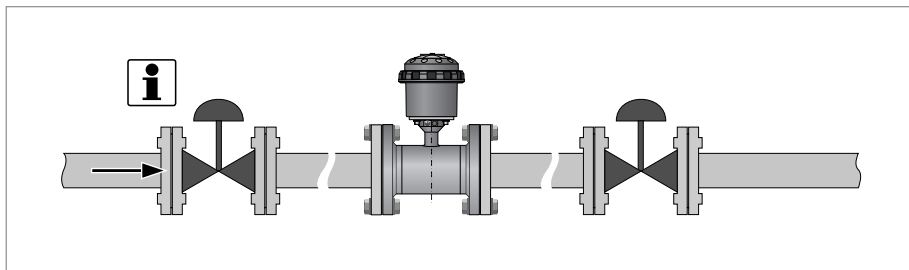


Figure 2-13: Recommended installation: in front of a control valve



### **INFORMATION!**

Recommended position to install a flowmeter is upstream a control valve.

An electromagnetic flowmeter can be installed downstream of the control valve if there is no cavitation in the pipeline system (e.g. flow profile disturbances are resolved).

## 2.8.7 Air venting and vacuum forces

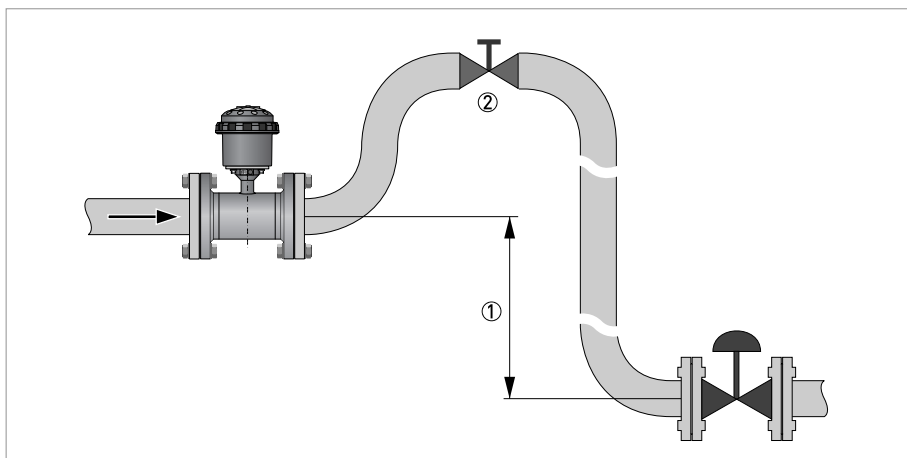


Figure 2-14: Air venting

- ①  $\geq 5$  m
- ② Air ventilation point

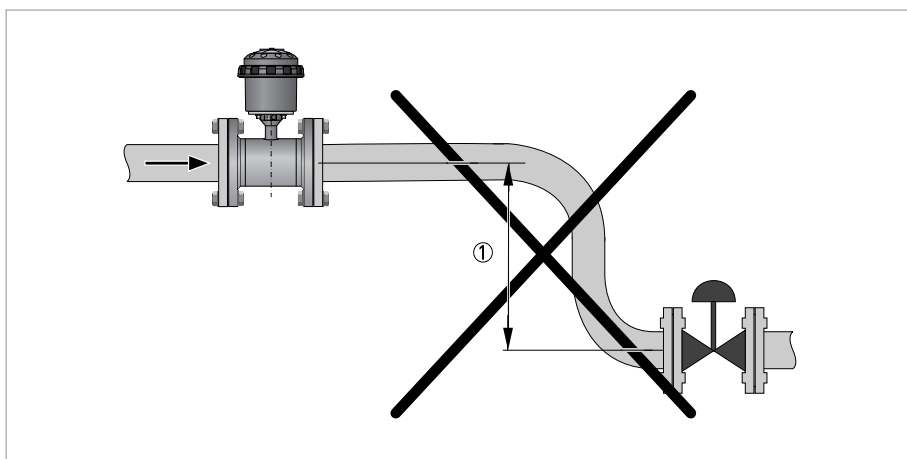


Figure 2-15: Vacuum

- ①  $\geq 5$  m

### 2.8.8 Flange Deviation

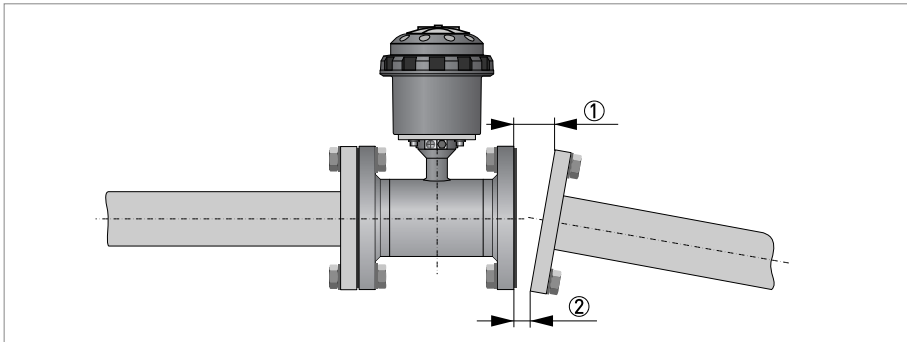


Figure 2-16: Flange deviation

- ①  $L_{max}$   
 ②  $L_{min}$



**CAUTION!**

Max. permissible deviation of pipe flange faces:  $L_{max} - L_{min} \leq 0.5 \text{ mm} / 0.02''$ .



**CAUTION!**

Use the proper tools to ensure the integrity of the meter and prevent damage to the Rilsan<sup>®</sup> coating.

### 2.8.9 Mounting position

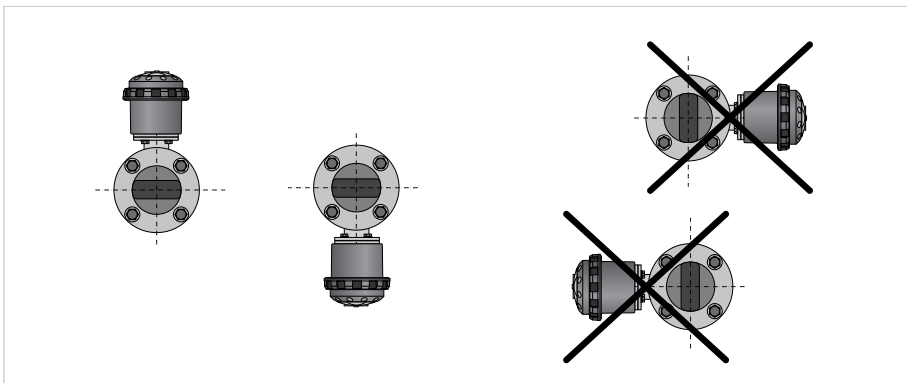


Figure 2-17: Mounting position

- Mount flow sensor either with the signal converter aligned upwards or downwards.
- Install flow sensor in line with the pipe axis.
- Pipe flange faces must be parallel to each other.

### 2.8.10 Installation in a metering pit and subsurface applications

The WATERFLUX 3000 flow sensor is IP68 rated / NEMA 4X/6P to IEC/EN 60529. It is suitable for continuous submersion in flooded measurement chambers and can withstand a 10 meter / 33 ft water column.

The compact and remote version of the IFC 070 signal converter is IP68 rated / NEMA 4/4X/6 and suitable for periodic submersion in flooded measurement chambers.

The signal converters have a polycarbonate housing and IP68 rated (military) plug and play connectors. Submersion under water is possible down to a depth of 10 meter / 33 ft. In applications with prolonged or continuous submersion, it is advised to use the WATERFLUX 3070 remote version. The remote IFC 070 signal converter and GPRS data logger unit can be installed on the wall of the measuring pit near the lid for visual read out of the display.

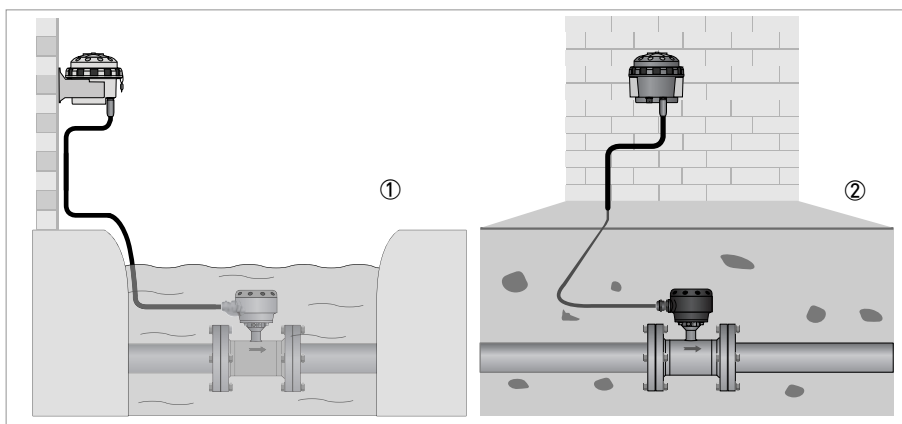


Figure 2-18: Examples of flooded and buried application

- ① Submersible
- ② Buried

#### Submersion applications

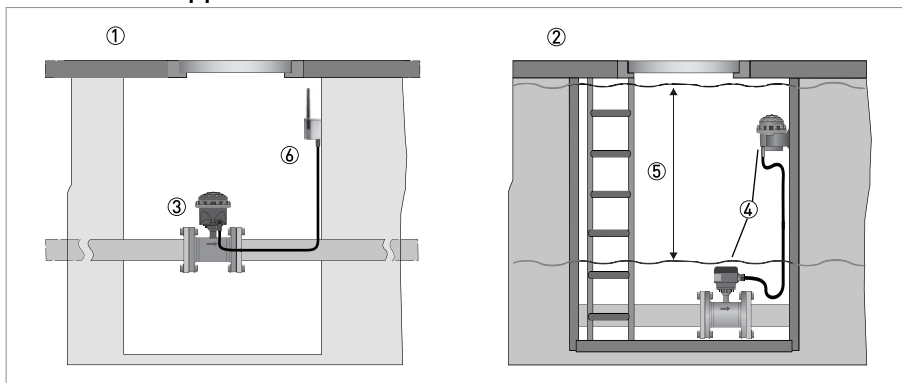


Figure 2-19: Examples of installation in measuring pit

- ① Periodic submersion
- ② Continuous submersion
- ③ Compact version
- ④ Remote version
- ⑤ Maximum water column 10 meter / 33 ft
- ⑥ GPRS / data logger unit (location)



**CAUTION!**

When installing flowmeter and GPRS/GSM module, follow supplier instructions.



## 2.9 Mounting

### 2.9.1 Torques and pressures

The maximum pressure and torque values for the flowmeter are theoretical and calculated for optimum conditions and use with carbon steel flanges.

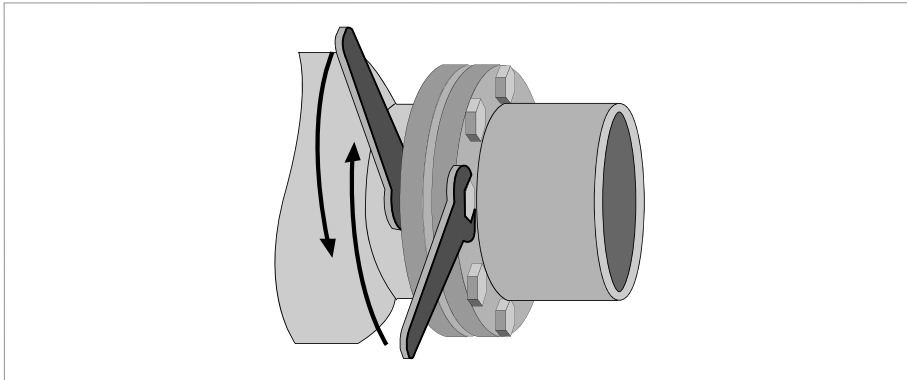


Figure 2-20: Tightening of bolts



#### Tightening of bolts

- Always tighten the bolts uniformly and in diagonally opposite sequence.
- Do not exceed the maximum torque value.
- Step 1: Apply approx. 50% of max. torque given in table.
- Step 2: Apply approx. 80% of max. torque given in table.
- Step 3: Apply 100% of max. torque given in table.

Nominal size DN [mm]	Pressure rating	Bolts	Max. torque [Nm] <sup>①</sup>
25	PN 16	4 x M 12	12
40	PN 16	4 x M 16	30
50	PN 16	4 x M 16	36
65	PN 16	8 x M 16	50
80	PN 16	8 x M 16	30
100	PN 16	8 x M 16	32
125	PN 16	8 x M 16	40
150	PN 10	8 x M 20	55
150	PN 16	8 x M 20	55
200	PN 10	8 x M 20	85
200	PN 16 <sup>②</sup>	12 x M 20	57
250	PN 10	12 x M 20	80
250	PN 16 <sup>②</sup>	12 x M 24	100
300	PN 10	12 x M 20	95
300	PN 16	12 x M 24	136
350	PN 10	16 x M 20	96
400	PN 10	16 x M 24	130
450	PN 10	20 x M 24	116
500	PN 10	20 x M 24	134
600	PN 10	20 x M 27	173

① The torque values also depend on variables (temperature, bolt material, gasket material, lubricants, etc.) outside the control of the manufacturer. Therefore these values should be regarded as indicative only.

② No full rating (max. 10 bar)

Nominal size [inch]	Flange class [lb]	Bolts	Max. torque [lbs.ft] <sup>①</sup>
1	150	4 x 1/2"	4
1½	150	4 x 1/2"	11
2	150	4 x 5/8"	18
2.5	150	8 x 5/8"	27
3	150	4 x 5/8"	33
4	150	8 x 5/8"	22
5	150	8 x 3/4"	33
6	150	8 x 3/4"	48
8	150	8 x 3/4"	66
10	150	12 x 7/8"	74
12	150	12 x 7/8"	106
14	150 ②	12 x 1"	87
16	150 ②	16 x 1"	84
18	150 ②	16 x 1 1/8"	131
20	150 ②	20 x 1 1/8"	118
24	150 ②	20 x 1 1/4"	166

① The torque values also depend on variables (temperature, bolt material, gasket material, lubricants, etc.) outside the control of the manufacturer. Therefore these values should be regarded as indicative only.

② No full rating (max. 150 psi / 10 bar).

## 2.10 Mounting of the signal converter



### INFORMATION!

Assembly materials and tools are not part of the delivery. Use the assembly materials and tools in compliance with the applicable occupational health and safety directives.

### 2.10.1 Remote signal converter housing

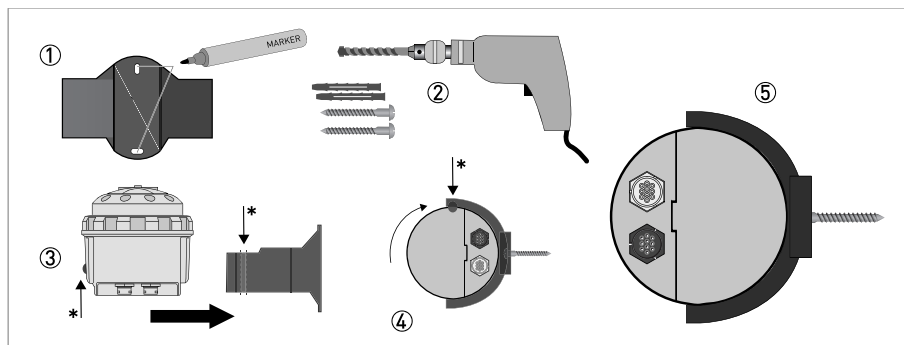


Figure 2-21: Mounting of the wall holder

- ① Mark the fixation points.
- ② Drill the holes and mount the holder with the right screws (e.g. M6 x 50 with washer) and plugs. Do not exceed a tightening torque of 2 Nm / 1.5 lb-ft when fastening the screws. This can damage the wall holder.
- ③ Slide the IP68 remote version housing into the holder as shown. Make sure that the positioning cam \* is placed in the guiding provided for that purpose (power and data connectors positioned on the backside).
- ④ Turn the housing 180° counter clockwise (until the power and data connectors are on the front side). Make sure that the holder snaps into the lock of the wall holder.
- ⑤ Bottom view of the IP68 remote version in to the wall holder.

### 2.10.2 Closing of the signal converter housing

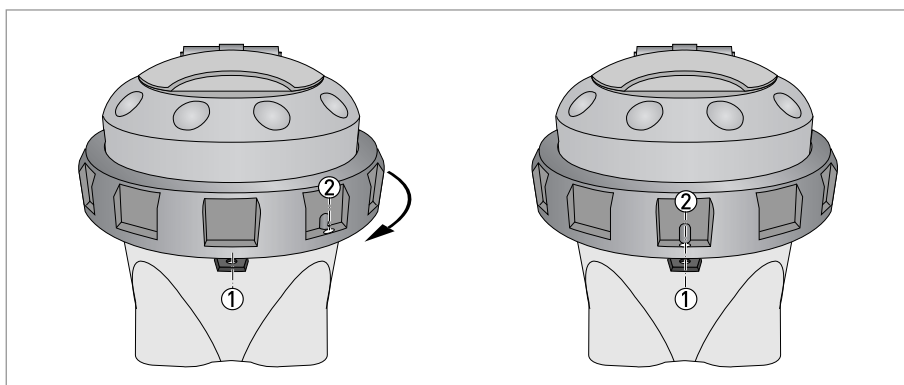


Figure 2-22: Closing of the signal converter housing



- Before closing the case of the signal converter, ensure that all surfaces in contact with the seals are clean.
- Position the upper part of the case and tighten the lock ring, up until the positions of points ① and ② are in line (do not tighten the ring any further).
- Use the special wrench to tighten the ring as advised above.
- If applicable, place a new utility seal (see section Utility Seal).

### 2.10.3 Mounting of the KROHNE FlexPower unit

The mounting of the KROHNE FlexPower unit is possible in the following options:

- Surface mounting with 2 screws on a wall or other sufficient hard surface
- On-pipe mounting with 2 Tie-Wraps

For mounting on a horizontal or vertical surface, always use the proper tools and mounting materials (e.g. drill, plug and screws). The distance between the two mounting holes is 184 mm / 7.2". Always mount the KROHNE FlexPower unit on the intended location before connecting to the flow sensor and/or switching on the main power. When attaching the wall holder unit to the wall, do not exceed a tightening torque of 1 Nm / 0.74 lb-ft when fastening the screws. This can damage the mounting eyelets.

Mounting on the pipe line construction can easily be done by using 2 Tie-Wraps. The bottom of the housing of the KROHNE FlexPower unit is designed for mounting on a pipe line. Choose the correct size and properties of the Tie-Wraps (specifications according ambient temperature and other conditions, size, width max. 14 mm / 1/2"). Consider releasable types of Tie-Wraps when mobility and/or replacing of mounting is expected.

The KROHNE FlexPower unit is IP68 rated.



**CAUTION!**

Prevent water ingress to the AC or DC cable when not connected.

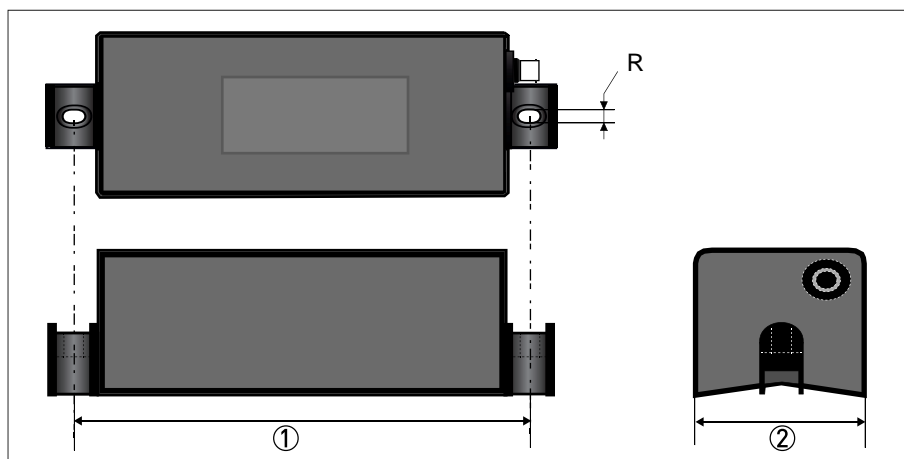


Figure 2-23: Dimensions KROHNE FlexPower

① distance = 184 mm / 7.2"

② width of unit = 74 mm / 2.9"

R = size of mounting hole; 6 mm / 1/4"

### 3.1 Safety instructions

**DANGER!**

All work on the electrical connections may only be carried out with the power disconnected.  
Take note of the voltage data on the nameplate!

**DANGER!**

Observe the national regulations for electrical installations!

**WARNING!**

Observe without fail the local occupational health and safety regulations.  
Any work done on the electrical components of the measuring device may only be carried out by properly trained specialists.

**INFORMATION!**

Look at the device nameplate to ensure that the device is delivered according to your order.  
Check for the correct supply voltage printed on the nameplate.

### 3.2 Grounding

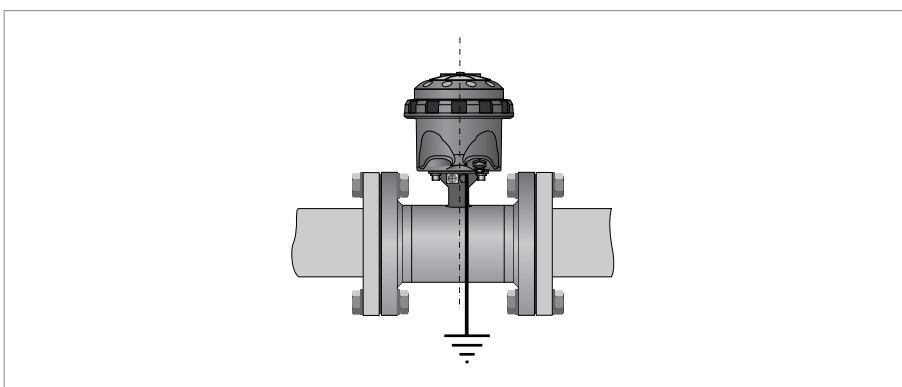


Figure 3-1: Grounding

**INFORMATION!**

Grounding without grounding rings. The flow sensor is equipped with a reference electrode.

### 3.3 Cable overview

The following overview describes the different cables available for the compact and remote version.

The flow sensor cable for the IP68 remote (field) version has an 8 pin male connector. The I/O cable (pulse /modbus) is available in a KROHNE FlexPower version and has an additional power cable connection.

Overview I/O cables, with or without a power cable, with female connector:

#### IP68 Cable versions

I/O version	KROHNE FlexPower cable	PIN
Modbus cable	N	4
Pulse cable	N	8
KGA 42	N	8
Modbus cable	Y	10
Pulse cable	Y	8
KGA 42	Y	8

#### Electrical values

- **Pulse output**  
**2x Pulse output passive - (maximum 3 outputs possible, see status output):**  
 $f \leq 100 \text{ Hz}$ ;  $I \leq 10 \text{ mA}$ ;  $U: 2.7...24 \text{ VDC}$  ( $P \leq 100 \text{ mW}$ )
- **Status output**  
**2x Status output passive - (1 status output can be used as a third pulse output):**  
 $I \leq 10 \text{ mA}$ ;  $U: 2.7...24 \text{ VDC}$  ( $P \leq 100 \text{ mW}$ )
- **Communication**  
 Modbus RTU output - (detailed information available in Supplementary Manual)
- **Optional:**  
 KGA external data logger / GSM module - (see the KGA 42 Supplementary Manual)

### 3.4 Connection of the flow sensor cable



**CAUTION!**

*Make sure the device functions properly, always use the signal cables included in the delivery*

The compact version of the WATERFLUX 3070 is already internally connected to the flow sensor and has different options to connect pulse, Modbus and/or external supply cables. See the following sections for the different options and available cables.

For the WATERFLUX 3070 remote version, a standard cable is delivered with the device. On the flow sensor side the cable is as standard potted at the factory. The flow sensor cable has a IP68 rated stainless steel snap-on connection to connect the flow sensor with the IP68 field signal converter the cables have the following colour coded leads:

#### Standard flow sensor cable

Wire colour	Terminal	Function
Brown	1	Reference electrode
White	2	Standard electrode signal
Violet	3	Standard electrode signal
Blue	7	Field current
Green	8	Field current
Yellow	9	No function
Drain wires	Screws	Shielding



**INFORMATION!**

*The standard WSC2 flow sensor cable (double shielded), includes both electrode and field current leads and has a maximum length of 25 m / 82 ft. (other lengths on request).*

#### Flow sensor cable with integrated P&T option

Wire colour	Contact on connector	Terminal	Function
Brown	H	1	Reference electrode / P&T sensor
White	D	4	P&T sensor
Grey	F	5	P&T sensor
Pink	B	6	P&T sensor
Blue	A	7	Field current
Green	G	8	Field current
White/White	C	2	Standard electrode signal
White/Red	E	3	Standard electrode signal
Drain wires	Housing	Screws	Shielding



## 3.5 Connection of the signal cable

### 3.5.1 IP68 housing (compact version)

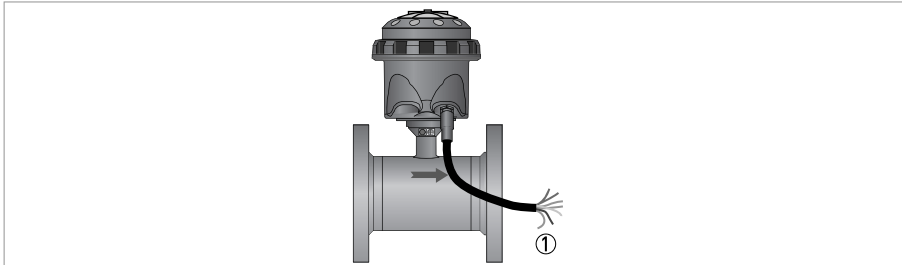


Figure 3-2: Output cable at IP68 compact version

① Color coded leads of the output cable

If an output is activated, the output cable with the IP68 rated connector has the following color coded leads:

#### Pulse output cable

Wire color	Contact on connector	Function
Yellow	A	Status output 1 or threshold for P or T or pulse output C
White	G	Status output 2 or threshold for P or T
Blue	H	Ground
Brown	B	Pulse output A
Green	F	Pulse output B
Pink	C	External battery +
Grey	E	External battery -

Note; with or without shielding

#### Modbus cable

Wire color	Contact on connector	Function
Yellow	1	Down link wire B Sign. B (D1+) ←
Grey	1	Up link wire B Sign. B (D1+) →
Pink	2	Up link wire A Sign. A (D0-) →
Green	2	Down link wire A (D0-) ←
White	3	Ground
Brown	-	-
Shield	Earth	

Note: see the next chapter for the combined power and modbus / pulse cable options.

3.5.2 IP68 housing (remote version)

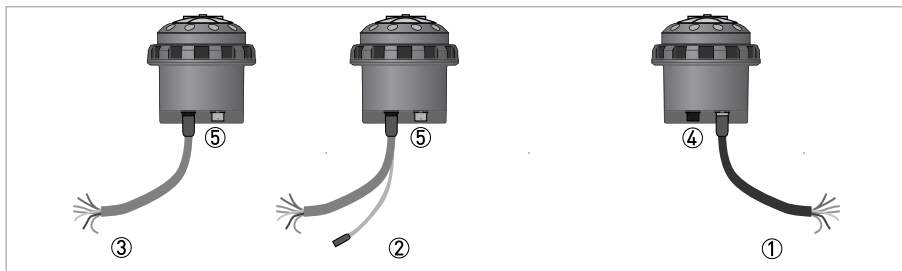


Figure 3-3: Different output cable, IP68 remote version

- ① Color coded leads of flow sensor cable
- ② Y - cable with additional power cable
- ③ I/O cable (pulse, modbus)
- ④ I/O connection
- ⑤ Stainless steel flow sensor cable connection

**Flow sensor cable:**

For more information; refer to *Connection of the flow sensor cable* on page 24 for the available connection options.

For connection of I/O (modbus, pulse output signals) with or without additional power supply cable connection, several cable connection options are available. The cables have the following color code leads.

**Output pulse cable**

Wire color	Contact on connector	Function
Yellow	A	Status output 1 or threshold for P or T or pulse output C
White	G	Status output 2 or threshold for P or T
Blue	H	Ground
Brown	B	Pulse output A
Green	F	Pulse output B
Pink	C	External battery +
Grey	E	External battery -

**Modbus cable**

Wire color	Contact on connector	Function
Yellow	1	Down link wire B Sign. B (D1+) ←
Grey	1	Up link wire B Sign. B (D1+) →
Pink	2	Up link wire A Sign. A (D0-) →
Green	2	Down link wire A Sign. A (D0-) ←
White	3	Ground
Brown	-	-
Shield	Earth	

**Combined power and pulse output cable (Y-cable)**

Wire color	Contact on connector	Function
Yellow	A	Status output 1 or threshold for P or T or pulse output C
White	G	Status output 2 or threshold for P or T
Grey	H	Ground
Brown	B	Pulse output A
Green	F	Pulse output B
Brown	C	External power +3.6V
White	E	External power (Ground)
Shield	D	Shielding

**Combined power and Modbus cable (Y-cable)**

Wire color	Contact on connector	Function
Shield	C	Shielding
Brown	B	-
White	A	Ground
Green	E	Down link wire A Sign. A (D0-) ←
Yellow	K	Down link wire B Sign. B (D1+) ←
Pink	H	Up link wire A Sign. A (D0-) →
Grey	J	Up link wire B Sign. B (D1+) →
Brown	F	External power +3.6V
White	G	External power (Ground)
Shield	D	Shielding

This cable has two pairs of wires, one for uplink and one for downlink. Both are connected within the connector. When disconnecting the cable on the flow sensor side, the two paired wires will stay connected so there is disconnection of the RS-485.

Because of this connection (switching link wire), it makes no difference where the up- and downlink are connected.

**INFORMATION!**

*For proper use and installation, it is recommended to follow the advised color coded wire connections in the table above. A 120 Ω line terminator is required when the WATERFLUX 3070 signal converter is the last device in line and/or is part of the bus connection.*

*Specific information is described in the supplementary Modbus manual, available on the manufacturer website.*

## 4.1 Types of batteries

Two types of batteries with different capacities are available. They can be exchanged by one of the other types.

As standard the IFC 070 signal converter is delivered with a lithium dual D cell (3.6V 38 Ah). Optionally, an external battery pack with a lithium dual DD cell (3.6V 70 Ah) can be connected.

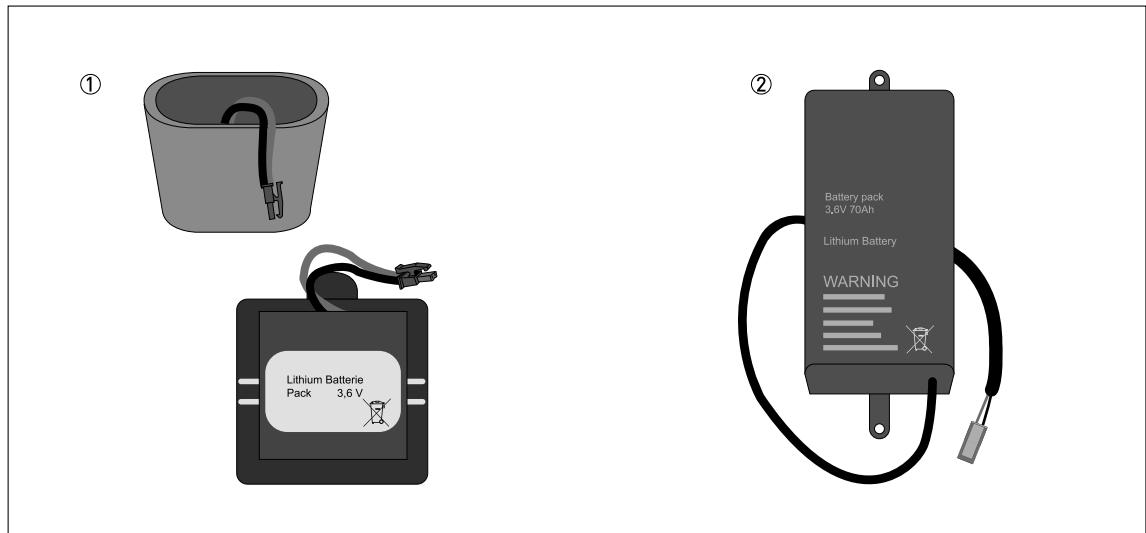


Figure 4-1: Batteries and battery holders

- ① Internal dual D-cell battery (without / in holder)
- ② External dual DD-cell KROHNE PowerBlock

## 4.2 Connecting the internal battery



### CAUTION!

Please connect the battery before first use. The signal converter is delivered with a disconnected battery.



### INFORMATION!

For transport purposes signal converters which are verified to MI-001 or OIML R49 have also disconnected batteries. Please connect battery before placing the local utility seal.

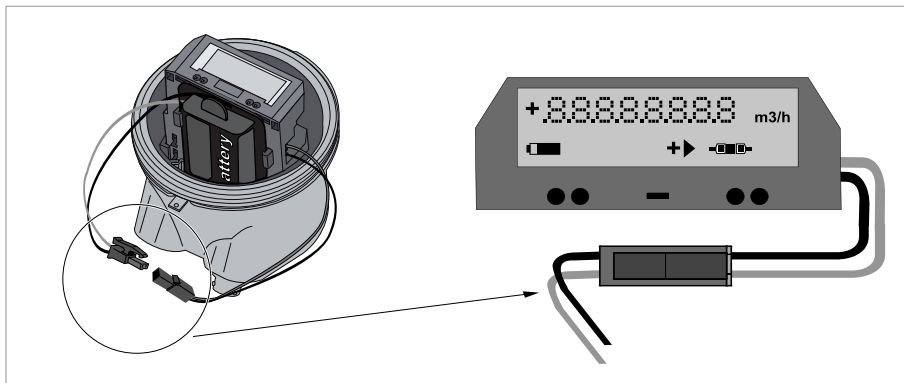


Figure 4-2: Connecting the battery



- Remove the cover.
- Fasten the battery connector of the power cable to the internal connector in the signal converter.
- Check if the display lights up.
- Put back the cover.



### WARNING!

Make sure that the battery cable is not jammed by the cover.



- For closing the case of the device in the IP68 housing refer to *Closing of the signal converter housing* on page 20.

For information on the different battery types refer to *Types of batteries* on page 28.



### INFORMATION!

The device now operates with default menu settings.

For configuration of these menu settings refer to *Battery settings* on page 30.

## 4.3 Connecting the external battery

### 4.3.1 Battery settings

After changing the batteries:

- Reset the battery lifetime counter (Menu number B2)
- Select the battery type, if a different type of battery is used. (Menu number B0)
- Change the total battery capacity, if a different type of battery is used. (Menu number B1)

No.	Function	Options	Description
B0	Battery type	0 = No battery	A wrong setting influences the battery lifetime calculation.
		2 = Two internal batteries	
		3 = External battery pack	
		4 = FlexPower (2 battery)	
B1	Total battery capacity	xxx.xx = 019.00 (19.000 Ah)	Total of all batteries in Ah. After a change to a different battery type, change the setting (19 one battery, 38 two batteries, or 70 external battery)
B2	Reset battery lifetime counter	0 = Off	Set the value to 1 to reset the battery lifetime counter. After a reset, the menu setting automatically goes back to 0.
		1 = Reset	
B3	Modbus operating in case of power supply failure	0 = Off	Default = Off
		1 = On	

### 4.3.2 IP68 housing (compact and remote version)

The output cable has two color coded leads for connecting the external battery.

For detailed information refer to *IP68 housing (compact version)* on page 25 and refer to *IP68 housing (remote version)* on page 26.

For more information regarding the battery menu settings refer to *Battery settings* on page 30.

## 4.4 Power supply - battery

The standard version of the WATERFLUX 3070 has an internal battery pack with a Lithium double D cell (3.6V-38 Ah). Optional an KROHNE PowerBlock (Lithium Dual DD cell 3.6V-70 Ah) can be connected with an IP68 rated, 1.5 meter long cable. There is no loss of totalizer data when exchanging and/or replacing battery/power supply.

More information regarding the exchange / replacing of battery, typical lifetimes of batteries, see the manual.

## 4.5 Power supply - KROHNE FlexPower



### **WARNING!**

*Fire, explosion and severe burn hazard. Do not recharge, disassemble, or heat above 70 °C / 158 °F. Do NOT incinerate or expose contents to water.*

Beside regular battery power supplies, the WATERFLUX 3070 can also be connected to an external KROHNE FlexPower unit.

The external KROHNE FlexPower unit has an internal Lithium battery pack (3.6 V -38 Ah) and can be connected with a combined power and output cable (Y-cable) for power input. The unit is delivered with a special power cable for connection to a 10...30 V DC supply (a.o. through wind- and/or solar energy supplies) and a cable for connecting to mains supply (110...230 V AC / 50 - 60 Hz).

The FlexPower unit has two, not rechargeable internal batteries (3.6 V -38 Ah) for battery backup mode. There is no loss of totalizer data when connecting / disconnecting the KROHNE FlexPower unit.



Figure 4-3: KROHNE FlexPower supply

### 4.5.1 Connection of the FlexPower unit

**DANGER!**

*Observe the notes as described in this section with respect to the installation and connection of the AC and/or DC supply!*

**CAUTION!**

*Rout non connected cables back to the power distribution box. Install cables correctly even when no power is to be connected!*

*Take measures to prevent water ingress and shock hazard on AC and/or DC cables when not connected.*

Optionally, beside an internal or external battery, the WATERFLUX 3070 can be connected to an external FlexPower unit for mains power and/or DC power operation with battery back-up.

The input power for the KROHNE FlexPower can be realized by connection to an AC/DC supply source:

- AC mains supply source: 110...230 V AC - 50/60 Hz
- DC supply source: 10...30 V DC

Automatically a start-up routine is followed, when the WATERFLUX 3070 with the FlexPower is connected properly to a live AC and/or DC supply. First the DC input is checked and if present and AC/DC converter active, the power source is DC. When AC power is present and AC/DC converter active, the power source is AC/DC. If both are not available (interrupted) the internal dual D-cell battery pack (3.6V - 38 Ah) automatically takes over the power supply.

To save energy, the WATERFLUX 3070 will automatically switch to the low power consuming battery backup mode and will continue to totalize volumes but temporarily stop to transfer the data.

The FlexPower unit is IP68 rated and totally sealed and potted to prevent ingress of water. Therefore the integrated batteries cannot be changed.



### Power input / output

The 3.6V **DC power output** of the FlexPower can easily be connected with the cable assembly that is delivered with the FlexPower unit. The UTS snap-on connector of the cable fits in only one way to the female connector on the FlexPower unit.

As described, **the power input** of the FlexPower can either be chosen an AC and/or DC input. To prevent water ingress and/or shock hazard, both cable ends are IP68 sealed. If possible, it is advised to connect both AC and DC inputs on the main power source.

When one of the input cables remain disconnected, make sure that this cable is correctly installed to prevent damage to the IP68 sealed end.

### DC power cable (green cable)

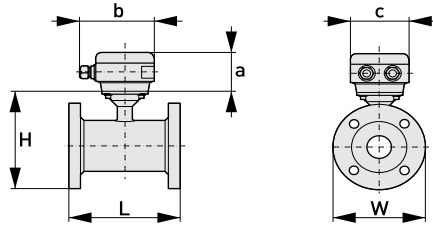
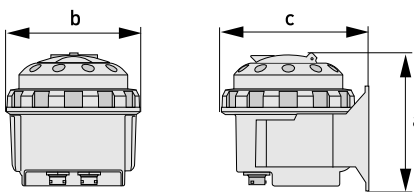
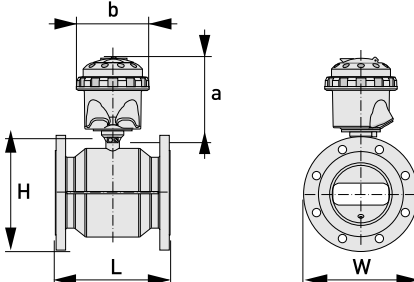
Wire color	Connection
Red	DC (+)
Blue	DC (+)
Yellow/Green	FE (functional earth)

### AC power cable (grey cable)

Wire color	Connection
Black 1	AC (~)
Black 2	AC (~)
Green/Yellow	PE (protective earth)

Cable  $\varnothing = 0.75 \text{ mm}^2$

5.1 Dimensions and weights

<p>Remote flow sensor</p>		<p>a = 88 mm / 3.5"</p> <p>b = 139 mm / 5.5" ①</p> <p>c = 106 mm / 4.2"</p> <p>Total height = H + a</p>
<p>Remote signal converter in polycarbonate housing (IP68)</p>		<p>a = 171 mm / 6.7"</p> <p>b = 161 mm / 6.3"</p> <p>c = 177 mm / 7"</p>
<p>Compact version in polycarbonate housing (IP68)</p>		<p>a = 159 mm / 6.3"</p> <p>b = 161 mm / 6.3"</p> <p>Total height = H + a</p>

① The value may vary depending on the used cable glands.

**INFORMATION!**

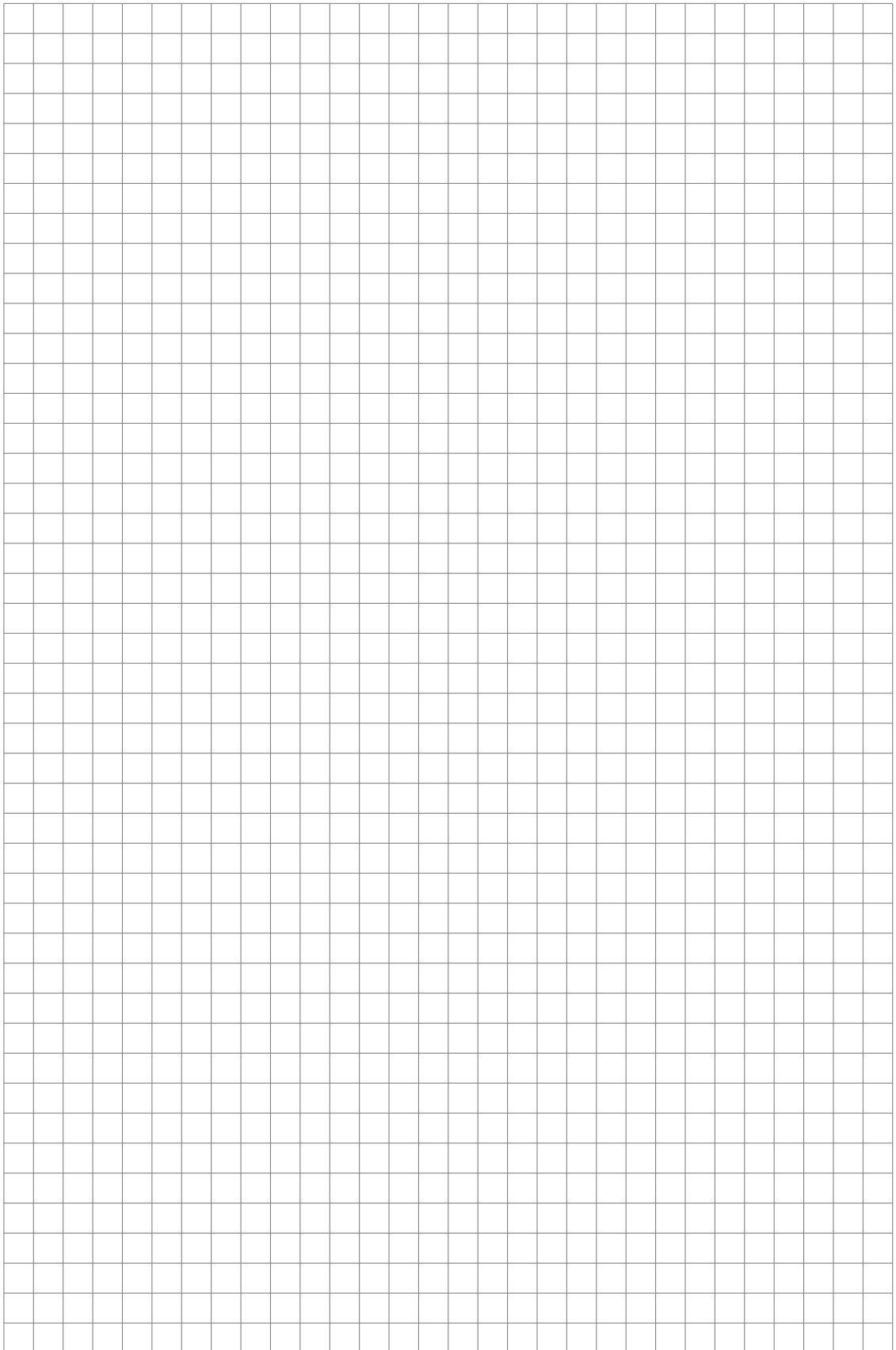
- All data given in the following tables are based on standard versions of the flow sensor only.
- Especially for smaller nominal sizes of the flow sensor, the signal converter can be bigger than the flow sensor.
- Note that for other pressure ratings than mentioned, the dimensions may be different.
- For full information on signal converter dimensions see relevant documentation.

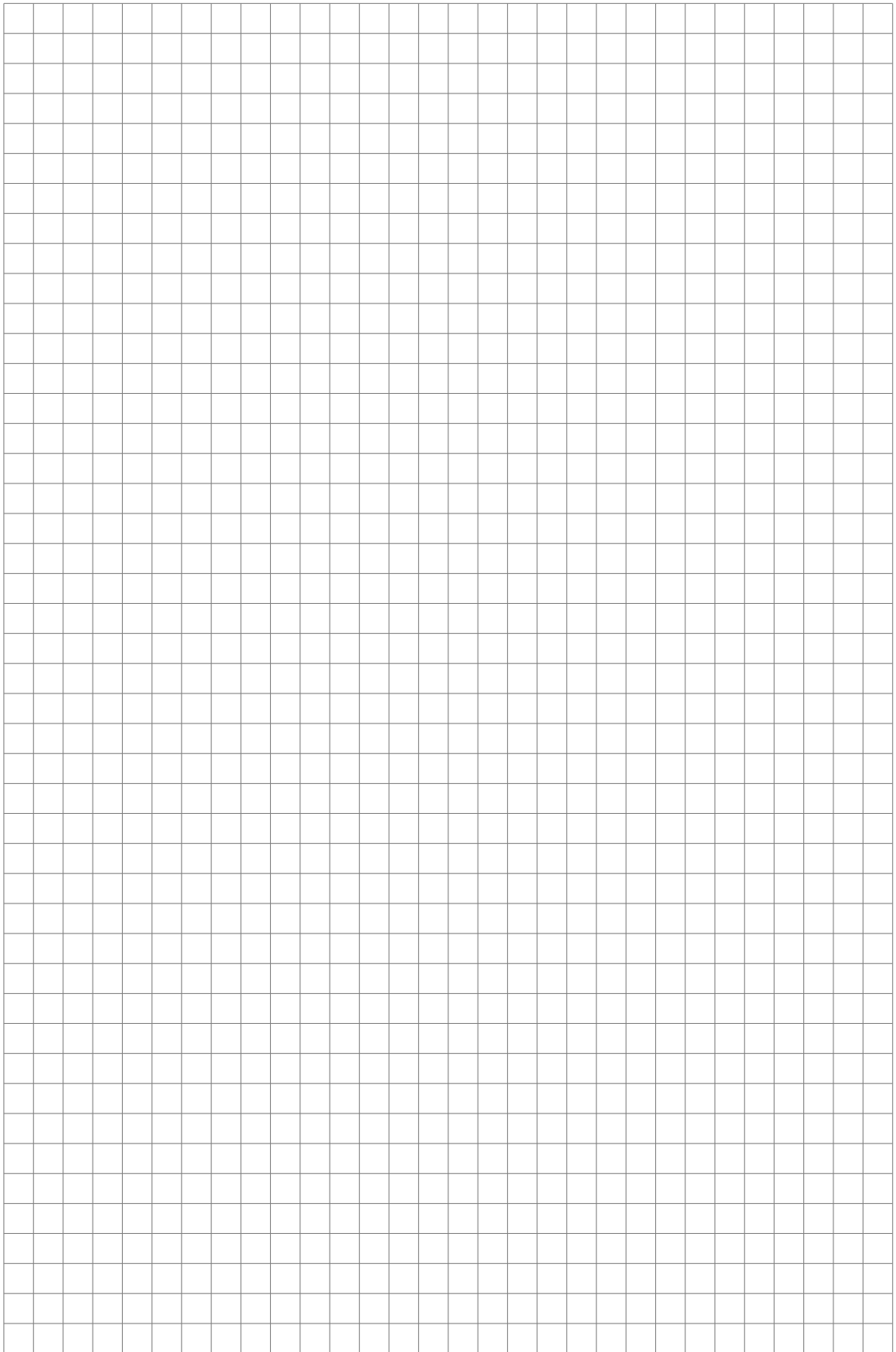
**EN 1092-1**

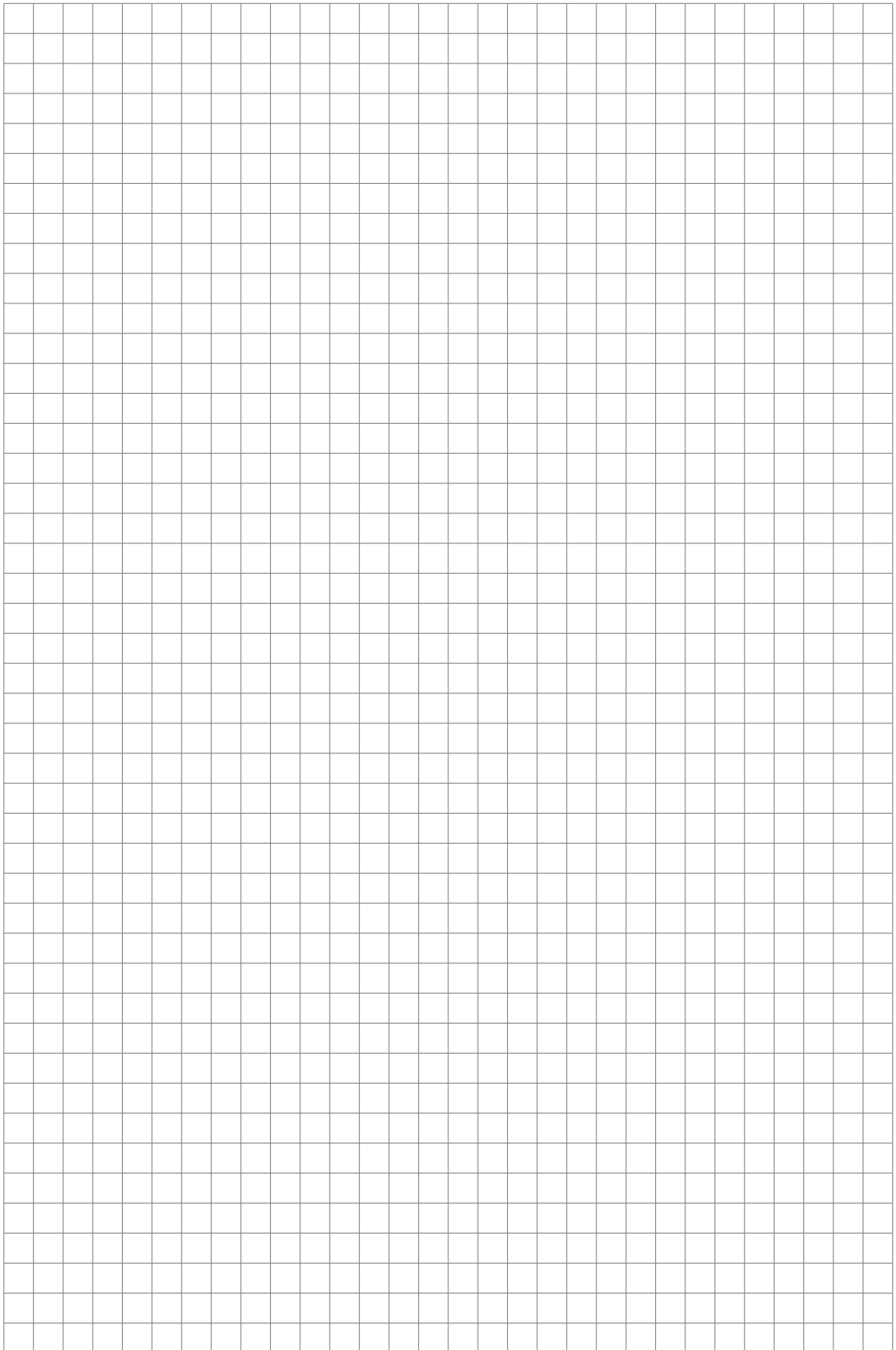
Nominal size DN [mm]	Dimensions [mm]			Approx. weight [kg]
	L	H	W	
25	150	151	115	5
40	150	166	150	6
50	200	186	165	13
65	200	200	185	11
80	200	209	200	17
100	250	237	220	17
125	250	266	250	21
150	300	300	285	29
200	350	361	340	36
250	400	408	395	50
300	500	458	445	60
350	500	510	505	85
400	600	568	565	110
450	600	618	615	125
500	600	671	670	120
600	600	781	780	180

## ASME B16.5 / 150 lb

Nominal size [inch]	Dimensions [inch]			Approx. weight [lb]
	L	H	W	
1	5.91	5.83	4.3	18
1½	5.91	6	4.9	21
2	7.87	7.05	5.9	34
3	7.87	8.03	7.5	42
4	9.84	9.49	9.0	56
5	9.84	10.55	10.0	65
6	11.81	11.69	11.0	80
8	13.78	14.25	13.5	100
10	15.75	16.3	16.0	148
12	19.7	18.8	19.0	210
14	27.6	20.7	21	290
16	31.5	22.9	23.5	370
18	31.5	24.7	25	420
20	31.5	27	27.5	500
24	31.5	31.4	32	680







## **KROHNE – Products, Solutions and Services**

- Process instrumentation for flow, level, temperature, pressure measurement and process analytics
- Flow metering, monitoring, wireless and remote metering solutions
- Engineering, commissioning, calibration, maintenance and training services

Head Office KROHNE Messtechnik GmbH  
Ludwig-Krohne-Str. 5  
47058 Duisburg (Germany)  
Tel.: +49 203 301 0  
Fax: +49 203 301 10389  
info@krohne.de

The current list of all KROHNE contacts and addresses can be found at:  
[www.krohne.com](http://www.krohne.com)

**KROHNE**