

## OPTIMASS 7400 Single, straight tube mass flowmeter



Installation, assembly, start-up and maintenance may only be performed by appropriately trained personnel. Check the nameplate for correct operating conditions.



For use in hazardous areas, special codes and regulations are applicable. Instruments must not be connected to power supply before reading instructions described in the supplementary manual.



This instrument complies with the requirements of the Pressure Equipment Directive. Please refer to the nameplate for operating condition limits. Instruments must not be pressurised before reading instructions described in the manual.



This instrument complies with the requirements of the Low Voltage Directive. Instruments must not be connected to the power supply before reading the instructions described in the manual.



For devices used in SIL applications, additional safety notes apply. For detailed information refer to the "Safety Manual".



The responsibility as to the suitability, intended use and corrosion resistance of the used materials against the measured fluid of this device rests solely with the operator.

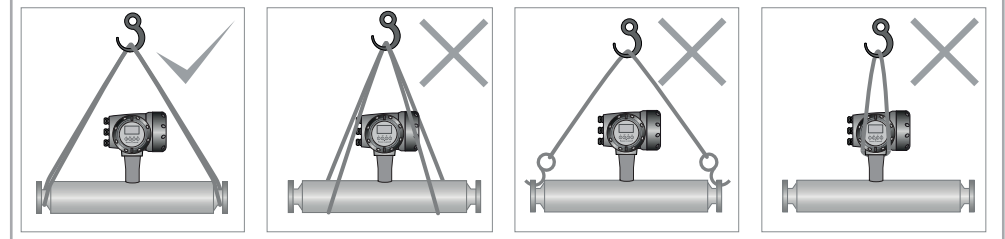
## 1 Installation



Special conditions of use to be observed

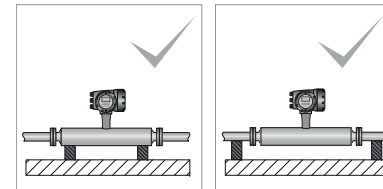
- The OPTIMASS measuring system and MFC converter must be included in the equipotential bonding system of any hazardous area installation.
- Allow the electronics to de-energise before opening the electronics enclosure inside a hazardous area. The time needed to de-energise is 35 minutes for temp. class T6 and 10 minutes for Temp. class T5. There is no waiting time for Temp. class T1
- Use certified cable glands on cable entries. Use a certified plug to seal unused cable entries.
- Install connecting cables as fixed wiring so that they are protected against damage. Connecting cables must not exceed the parameters specified in the Supplementary Instructions for Hazardous Areas.
- For details on the relationship between: maximum permissible ambient temperature, maximum medium temperature, maximum surface temperature and the relevant temperature class for each individual meter, please refer to the tables provided in the relevant meter Handbook and/or the Supplementary Instructions for Hazardous Areas.

### Handling the meter

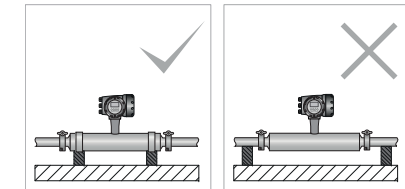


### Supporting the meter

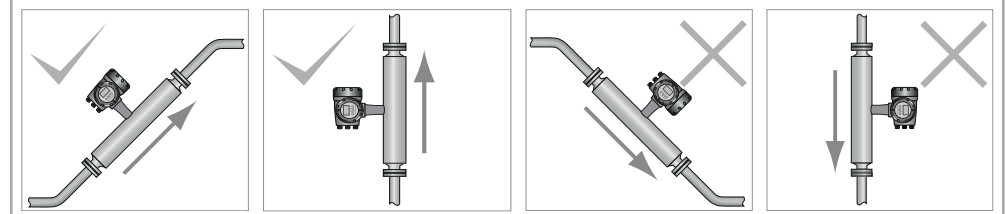
#### Flange connections



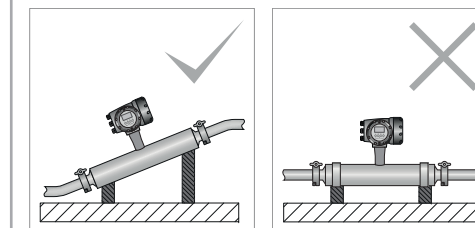
#### Hygienic connections



### Mounting positions



### Self draining (hygienic)



If the hygienic installation requires the meter to be self draining, mount the meter at an angle. DO NOT mount the meter horizontally!

### Excessive vibration

Vibration from pumps and other equipment in the process line can have an effect on the meter that, in some situations, can cause damage. Damage is most likely to occur if the meter has hygienic connections and the level of vibration is excessive.

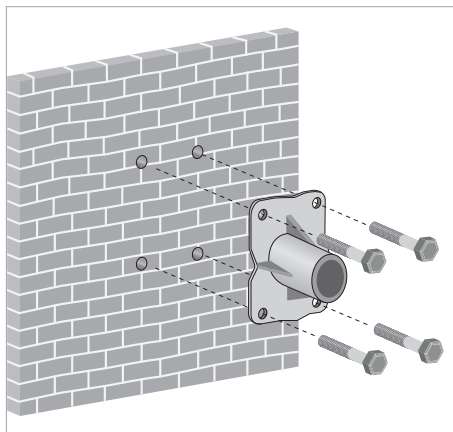


#### CAUTION!

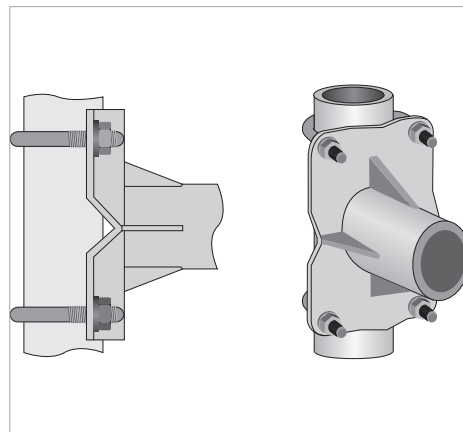
If there is excessive vibration in the process pipework, you must isolate the meter from its mounting. It is recommended that you place an insert made from rubber (or similar material) between the meter body, or pipework, and the mounting clamp or fixing point. For more information, contact the manufacturer.

### MFC 400 Remote

#### Wall mount



#### Field mount



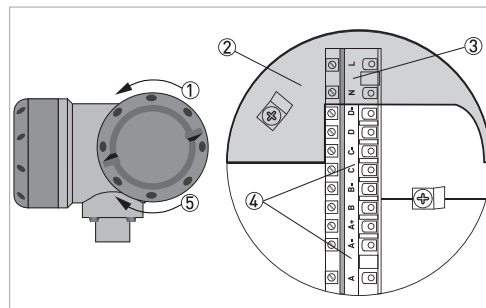
## 2 Electrical connections



#### Danger:

- Turn off the power supply before working on electrical connections.
- Check the voltage data on the nameplate
- Observe national regulations for electrical installations
- The device **MUST** be grounded in accordance with regulations to protect personnel against electric shock

### Compact



| POWER                                     | PE (FE)     | S/N: G190000001405041 | KROHNE                                                                                                                                       |
|-------------------------------------------|-------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
|                                           | L(L+) N(L-) | CG: CG33081100        |                                                                                                                                              |
| A = Active P = Passive NC = Not connected |             |                       |                                                                                                                                              |
| INPUT / OUTPUT                            | D -         | P                     | PULSE OUT / STATUS OUT<br>I <sub>max</sub> = 100 mA@f<=10 Hz; = 20 mA@f<=12 kHz<br>V <sub>o</sub> = 1.5 V @ 10 mA; U <sub>max</sub> = 32 VDC |
|                                           | C -         | P                     | STATUS OUT<br>I <sub>max</sub> = 100 mA; V <sub>max</sub> = 32 VDC                                                                           |
|                                           | B -         | P                     | STATUS OUT / CONTROL IN<br>I <sub>max</sub> = 100 mA<br>V <sub>on</sub> > 19 VDC; V <sub>off</sub> < 2.5 VDC; V <sub>max</sub> = 32 VDC      |
|                                           | A +         | A                     | CURRENT OUT (HART)                                                                                                                           |
|                                           | A -         | or                    | Active (Terminals A & A+); RL <sub>max</sub> = 1 kohm                                                                                        |
|                                           | A           | P                     | Passive (Terminals A & A-); V <sub>max</sub> = 32 VDC                                                                                        |

The label (above) on the inside of the terminal compartment lid, gives information about output connections.

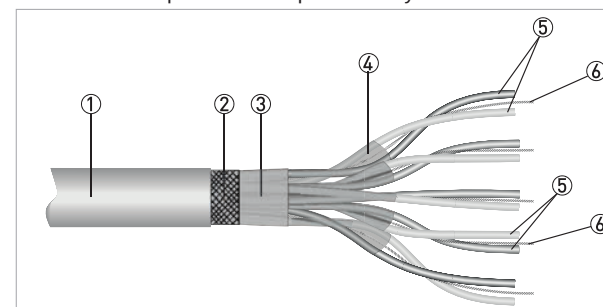
#### Procedure

1. Unscrew the housing cover ①
2. Open the touch guard ②
3. Put the electrical cable through the related cable gland
4. Connect the electrical wires ③
5. Close the touch guard ②
6. Put the signal cable/s through the related cable gland/s
7. Connect the signal cables ④
8. Replace the housing cover and tighten it with your hand ⑤.

#### Remote

##### Signal cable preparation

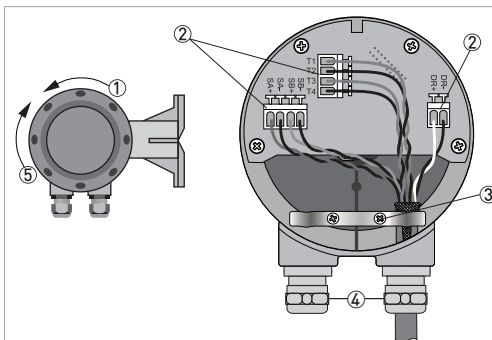
The signal cable is made up of five (twisted) pairs of cables. Each pair also has a drain wire and the three wires are covered in a foil wrap. The five cable pairs are covered in an outer foil wrap and a braided screen. The complete cable is protected by a PVC outer sheath



Strip back all the foil wraps and discard them. Unwrap the braided screen so that it can be twisted to form a connection underneath the earth clamp. Bend all five drain wires back and twist them together with the braided screen.

It is important that ALL five drain wires AND the braided screen form part of the shielding.

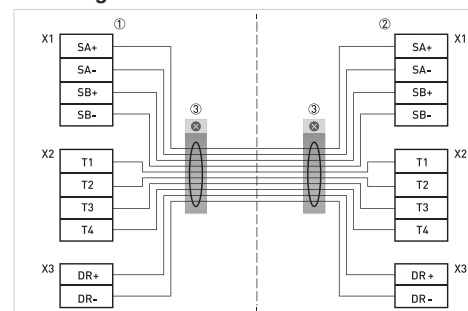
## Cable connections (sensor and converter)



### Procedure

- 1 Unscrew the housing cover ①
- 2 Put the electrical cable/s through the related cable gland/s ④
- 3 Connect the conductors ②
- 4 Run the twisted sink wires and the braided screen under the earth clamp ③
- 5 Fix the clamp in place using the two screws
- 6 Tighten the cable gland/s ④
- 7 Replace the housing cover and tighten it with your hand ⑤

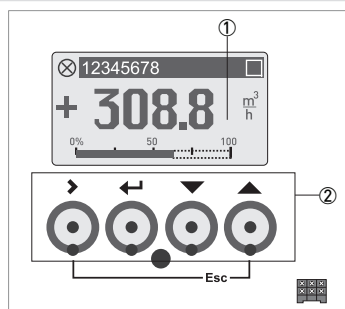
### Shielding



- ① Signal converter
- ② Flow sensor
- ③ Cable shielding

## 3 Quick setup

### Display



- ① Display (ER1.0.x shown)
- ② Optical operating keys

### Procedure:

Touch the glass directly in front of the optical operating keys to access menus.

If the optical keys are not used for a period of 5 minutes, the display will return to the measuring mode.

## Converter keys

| Key       | Measuring mode                                                                                           | Menu mode                                                  | Submenu or function mode                            | Parameter and data mode                                                           |
|-----------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|
| ➤         | Switch from measuring mode to menu mode. Press Optical key for 2.5s display shows "A0.0.0.0 Quick Setup" | Access to display menu, and then 1st submenu is displayed. | Access to displayed submenu or function             | For numerical values, move cursor (highlighted in blue) one position to the right |
| ⬅         | Reset display. "Quick Access" function                                                                   | Return to measuring mode                                   | Press 1 to 3 times, return to menu mode, data saved | Return to submenu or function, data saved                                         |
| ▲ or ▼    | Switch between display pages: measured value 1 + 2, trend page and status page                           | Select menu                                                | Select submenu or function                          | Use cursor to change number, unit, property and to move the decimal point         |
| Esc [➤+▲] | —                                                                                                        | —                                                          | Return to menu mode without acceptance of data      | Return to submenu or function without acceptance of data                          |

The menus shown below are only for the quick setup of the meter. For a complete list of menus please refer to the relevant converter Handbook.

The quick setup menus shown here are for electronic revision (ER)1.x and electronic revision (ER) 2.x.x. If you are not sure which electronics revision is installed on the converter, please check the nameplate.

Details of standard HART menus are shown in the converter Handbook. For information regarding menu structures for additional communication protocols, please refer to the relevant Supplementary Instructions.

### Zero calibration

#### ER 1.0.x

| Key   | Screen | Description and setting                                   |
|-------|--------|-----------------------------------------------------------|
| ➤     | A      | Quick Setup<br>Press and hold for 2.5 s, then release key |
| 2 x ▼ | C      | Setup                                                     |
| 3 x ➤ | C1.1.1 | Zero Calibration                                          |
| ➤     |        | Calibrate Zero?<br>Automatic                              |
| ⬅     |        | Please wait<br>Countdown from 40s                         |
|       |        | Calibrate zero<br>Passed                                  |
| ⬅     |        | Zero Calibration<br>+XX.XXX%                              |
| 5 x ⬅ |        | Save Configuration?<br>Yes                                |
|       |        | Display page                                              |

#### ER 2.x.x

| Key   | Screen | Description and setting                                   |
|-------|--------|-----------------------------------------------------------|
| ➤     | A0.0.0 | Quick Setup<br>Press and hold for 2.5 s, then release key |
| 2 x ▼ | C0.0.0 | Setup                                                     |
| 3 x ➤ | C1.1.1 | Zero Calibration                                          |
| ➤     |        | Calibrate Zero?<br>Automatic                              |
| ⬅     |        | Please wait<br>Countdown from 40s                         |
|       |        | Calibrate zero<br>Passed                                  |
| ⬅     |        | Zero Calibration<br>+XX.XXX%                              |
| 5 x ⬅ |        | Save Configuration?<br>Yes                                |
|       |        | Display page                                              |

## Quick setup menu

### ER 1.0.x

| Measure mode | Select Menu ▼▲    | Select menu and/or submenu ▼▲ | Select function & set data ▼▲▶ |
|--------------|-------------------|-------------------------------|--------------------------------|
| ←            | Press ▶ for 2.5 s |                               |                                |
|              | A Quick Setup     |                               |                                |
|              | ▶                 | A1 Language                   | ▶                              |
|              | ←                 | A2 Tag                        | ←                              |
|              |                   | A3 Reset                      |                                |
|              |                   | A3.1 Reset Errors             |                                |
|              |                   | A3.2 All Totalisers           |                                |
|              |                   | A3.3 Totaliser 1              |                                |
|              |                   | A3.4 Totaliser 2              |                                |
|              |                   | A3.5 Totaliser 3              |                                |
|              |                   | A4 Analogue Output            |                                |
|              |                   | A4.1 Measurement              |                                |
|              |                   | A4.2 Units                    |                                |
|              |                   | A4.3 Range                    |                                |
|              |                   | A4.4 Low Flow Cutoff          |                                |
|              |                   | A4.5 Time Constant            |                                |
|              |                   | A5 Digital Outputs            |                                |
|              |                   | A5.1 Measurement              |                                |
|              |                   | A5.2 Pulse Value Unit         |                                |
|              |                   | A5.3 Value p. Pulse           |                                |
|              |                   | A5.4 Low Flow Cutoff          |                                |
|              |                   | A6 GDC IR Interface           |                                |
|              |                   | A7 Flow Direction             |                                |
|              |                   | A8 Zero Calibration           |                                |
|              |                   | A9 Operation Mode             |                                |
|              | ▼▲                | ▼▲                            | ▼▲▶                            |

### ER 2.x.x

| Measure mode | Select Menu ▼▲    | Select menu and/or submenu ▼▲ | Select function & set data ▼▲▶ |
|--------------|-------------------|-------------------------------|--------------------------------|
| ←            | Press ▶ for 2.5 s |                               |                                |
|              | A Quick Setup     |                               |                                |
|              | ▶                 | A1.0.0 Language               | ▶                              |
|              | ←                 | A2 Reset                      | ←                              |
|              |                   | A2.1.0 Reset Errors           |                                |
|              |                   | A2.2.0 Stop all Simulations   |                                |
|              |                   | A2.3.0 All Totalisers         |                                |
|              |                   | A2.4.0 Totaliser 1            |                                |
|              |                   | A2.5.0 Totaliser 2            |                                |
|              |                   | A2.6.0 Totaliser 3            |                                |
|              |                   | A3 Configuration              |                                |
|              |                   | A3.1.0 Tag                    |                                |
|              |                   | A3.2.0 Measurement            |                                |
|              |                   | A3.3.0 Range                  |                                |
|              |                   | A3.4.0 Alarm Code             |                                |
|              |                   | A3.5.0 Low Flow Cutoff        |                                |
|              |                   | A3.6.0 Damping                |                                |
|              |                   | A3.7.0 Terminals C Type       |                                |
|              |                   | A3.8.0 Flow Direction         |                                |
|              |                   | A4.0.0 Safety Mode            |                                |
|              |                   | A5.0.0 SIL Verification       |                                |
|              |                   | A6.0.0 Unlock Device          |                                |
|              |                   | A7.0.0 Calibrate Zero         |                                |
|              |                   | A8.0.0 Operation Mode         |                                |
|              | ▼▲                | ▼▲                            | ▼▲▶                            |

#### Download documents and software

Scan the code on the nameplate or scan the following code and enter the serial number.



## Support

Contact Smith Meter Customer Support at:  
[MS.ResponseCenter@GuidantMeasurement.com](mailto:MS.ResponseCenter@GuidantMeasurement.com)

+1 814.898.5000

[www.kb.guidantmeasurement.com](http://www.kb.guidantmeasurement.com)