

# EL-FLOW<sup>®</sup> *Base*

Thermal Mass Flow Controllers for Gases

## Quick Installation Guide

Doc nr.: 9.17.060D Date: 08-03-2017



Start-up EL-FLOW<sup>®</sup> *Base* in 10 steps

# SCOPE OF THIS MANUAL

EL-FLOW **Base** instruments are standard and straightforward Mass Flow Controllers. They provide accurate measurement, fast response and stable control in common gas flow applications. The instruments operate on the principle of thermal mass flow measurement in ranges starting from 0,2...10 ml<sub>n</sub>/min up to 1,4...70 l<sub>n</sub>/min air-equivalent. They offer analog I/O-signals as well as digital RS232 communication and/or Modbus-RTU/RS485 as a standard feature. EL-FLOW **Base** is a member of Bronkhorst's most popular and field proven EL-FLOW® series.

This manual covers the short-form instructions for EL-FLOW **Base** mass flow instruments regarding:


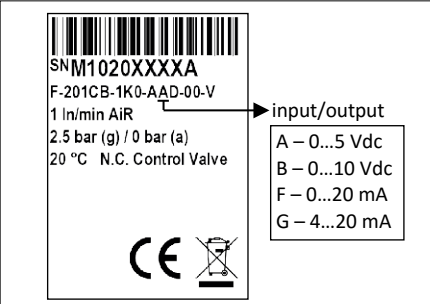

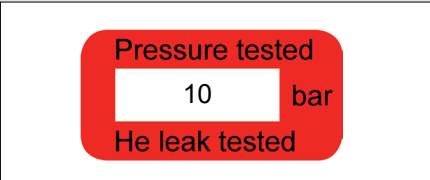

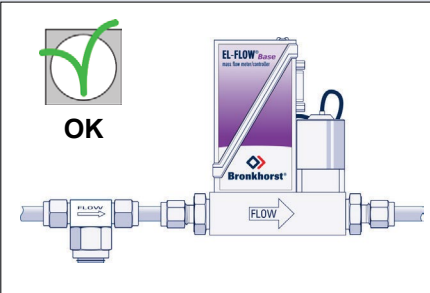
- start-up
- mounting
- zeroing
- operation

This manual will help you start-up your EL-FLOW **Base** in only 10 steps. More detailed information can be found in documents listed below:

- Instruction manual EL-FLOW **Base** series (document nr. 9.17.061)  
*Consists information for basic and advanced operation, more detailed product information and instructions for troubleshooting*
- FlowPlot Manual (document nr. 9.17.030)
- Hookup diagram EL-FLOW **Base** (document nr. 9.16.091)

These documents can be downloaded from the website: [www.bronkhorst.com](http://www.bronkhorst.com) or can be sent by e-mail on request.

## Starting-up

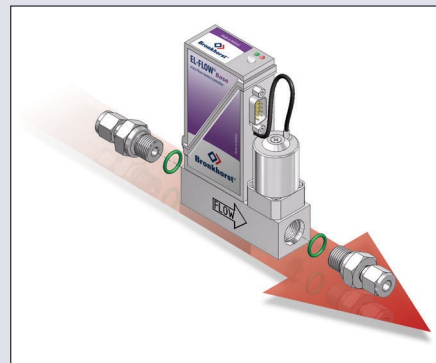
	<p><b>1. Check EL-FLOW Base properties:</b> Before installing your Mass Flow Meter/Controller it is important to read the attached label and check:</p> <ul style="list-style-type: none"><li>- Flow rate</li><li>- Fluid to be measured</li><li>- Up- and downstream pressures</li><li>- Input/output signal</li><li>- Temperature</li><li>- Valve type</li></ul>	
	<p><b>2. Check test-pressure:</b> Check the red-coloured sticker and make sure the test-pressure is in accordance with normal safety factors for your application. <b>EL-FLOW Base</b> instruments are tested up to the pressure indicated on the red sticker.</p>	
	<p><b>3. Check if system piping is clean:</b> For reliable measurement always make sure the fluid stream is clean.</p> <p>Use filters to assure a moisture-, oil- and particle-free gas stream. Recommended pore-size: 5 µm.</p> <p>If back flow can occur, a downstream filter and a check valve are recommended too.</p> <p>For high flow rates select a suitable filter size, to avoid too high pressure drop.</p>	

#### 4. Mount/install instrument properly:

Install the **EL-FLOW Base** Meter/Controller in the line, in accordance with the direction of the FLOW arrow. The arrow for flow direction is indicated on the body of the instrument.

Tighten the fittings according to the instructions of the supplier of the fittings.

The use of Swagelok RS-type stainless steel adapters is recommended, e.g. part number SS-400-1-4RS with Viton O-ring AS013 70°Sh.



Avoid installation in close proximity of mechanic vibration and/or heat sources.



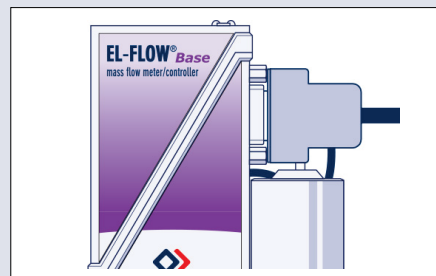
#### 5. Leak check:

Check the system for leaks before applying (fluid) pressure. Especially if toxic, explosive or other dangerous fluids are used!



#### 6. Electrical connection:

Electrical connections must be made with a standard cable or according to the **EL-FLOW Base** hook-up diagram, before switching on power.



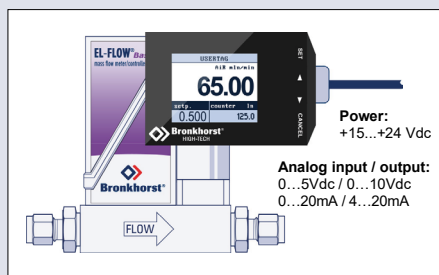
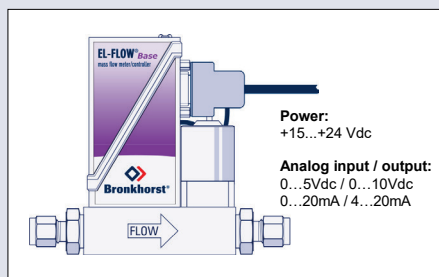
#### IP-40:

Please note that an **EL-FLOW Base** instrument is IP-40, implying that the electronics housing and electrical connection do not offer any protection against moist environments.

#### 7a. Analog/Local operation:

Connect the **EL-FLOW Base** to the power supply/readout unit using a cable with 9-pin sub-D connector.

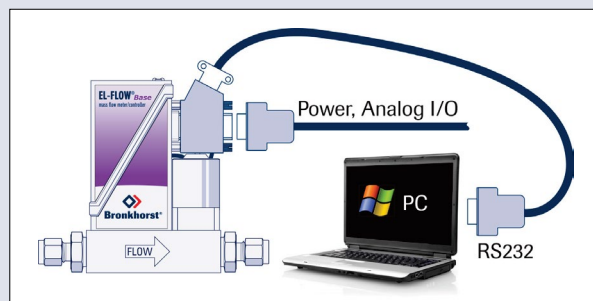
Examples:



#### 7b. BUS/digital operation:

For this procedure see description for RS232 operation or Modbus. RS232 connection cable 7.03.366 enables to use (free) Bronkhorst® tooling programs for Windows.

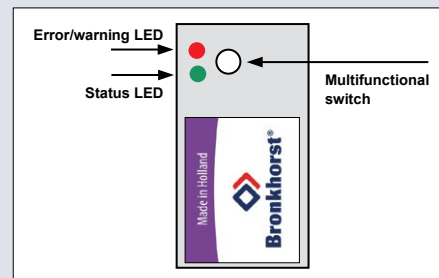
Example:



### 8. Multi-functional switch operation:

Using the 2 colored LEDs and the switch on the **EL-FLOW Base**, several actions can be monitored and started. The green LED is used for status indication. The red LED is used for errors/warnings/messages.

The switch can be used to start several actions, such as auto-zero, restore factory settings and bus-initialization actions, if applicable. See specific *zero-procedure* below (10) or see 'Instruction Manual **EL-FLOW Base** series' for more details.



### 9. Purging:

In systems for use with corrosive or reactive fluids, purging for at least 30 minutes with a dry, inert gas (like Nitrogen or Argon) is absolutely necessary before use. After use with corrosive or reactive fluids, complete purging is also required before exposing the system to air.

### Warm-up time:

Let the **EL-FLOW Base** warm-up for at least 30 minutes for best accuracy.

### 10. Zeroing:

The zero-point of each instrument is factory adjusted. If so required the zero point may be re-adjusted over RS232 or Modbus or by means of using the micro switch. Procedure for zeroing by micro switch:

- ◆ Warm-up, pressure up the system and fill the instrument according to the process conditions.
- ◆ Make sure no flow is going through the instrument by closing valves near the instrument.
- ◆ The setpoint must be zero.
- ◆ Press micro switch and hold it. After a short time the red LED will go ON and OFF, then the green LED will go ON. At that moment release the micro switch.
- ◆ The zeroing procedure will start at that moment and the green LED will blink fast. The zeroing procedure waits for a stable signal and saves the zero. If the signal is not stable, zeroing will take long and the nearest point to zero is accepted. The procedure will take approx. 10 seconds.
- ◆ When the indication is showing 0% signal and the green indication LED is burning continuously again, then the zeroing action was successful.

### Ready:

Your **EL-FLOW Base** MFC is now ready for operation.