

# EL-FLOW<sup>®</sup> *Select*

Thermal Mass Flow Meters/Controllers

## Quick Installation Guide

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Starting up EL-FLOW<sup>®</sup> *Select* in 10 steps

# SCOPE OF THIS GUIDE

This Quick Installation Guide covers the **EL-FLOW® Select** (including Metal Sealed) series Digital Mass Flow Meters and Controllers for gases. These instruments are designed for laboratory and clean processing conditions and are suited to measure and control flow ranges between 0,014...0,7 mln/min and 8...1670 ln/min, at pressures between vacuum and 400 bar. **EL-FLOW® Select** instruments are equipped with a digital printed circuit board, featuring diagnostics, alarm and counter functions, digital communication (RS232) and a PID controller. Thanks to the 'multibus' concept, instruments can be equipped with an onboard fieldbus interface as an option. The Multi Fluid / Multi Range option (to be specified at the moment of ordering) allows the user to select flow ranges and gas types, maintaining high accuracy and turndown ratio for measurement and control.

This Quick Installation Guide will help you start up your **EL-FLOW® Select** instrument in 10 steps, covering the following subjects:

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| <ol style="list-style-type: none"> <li>1. Checking functional properties</li> <li>2. Checking test pressure</li> <li>3. Checking piping</li> <li>4. Mounting/installing instrument</li> <li>5. Leak check</li> </ol> | <ol style="list-style-type: none"> <li>6. Electrical connection</li> <li>7. Analog/digital operation</li> <li>8. Multifunctional switch operation</li> <li>9. Purging</li> <li>10. Adjusting zero point</li> </ol> |
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## Other applicable documents:

- Manual **EL-FLOW® Select** series (document no. 9.17.099)

Interfaces	Manual	Hook-up diagram
- Analog/RS232 interface	9.17.027	9.16.119
- CANopen interface	9.17.131	9.16.217
- DeviceNet™ interface	9.17.026	9.16.122
- EtherCAT® interface	9.17.063	9.16.124
- EtherNet/IP interface	9.17.132	9.16.215
- FLOW-BUS interface	9.17.024	9.16.120
- Modbus ASCII / RTU interface	9.17.035	9.16.123
- Modbus TCP interface	9.17.035	9.16.234
- POWERLINK interface	9.17.142	9.16.236
- PROFIBUS DP interface	9.17.025	9.16.121
- PROFINET interface	9.17.095	9.16.148
- Custom bus & I/O configurations	n/a	9.16.118



- The instrument manual and hook-up diagrams can be downloaded from the **EL-FLOW® Select** product pages on the Bronkhorst website: [www.bronkhorst.com/products](http://www.bronkhorst.com/products)
- Other documents can be found on our general download page ([www.bronkhorst.com/downloads](http://www.bronkhorst.com/downloads))

## Starting up

<b>1</b>	<p><b>Check functional properties</b></p> <p>Before installing the instrument, check if the properties stated on the instrument label match your requirements:</p> <ul style="list-style-type: none"> <li>• Flow and/or pressure rate</li> <li>• Media to be used in the instrument</li> <li>• Upstream and downstream pressure(s)</li> <li>• Operating temperature</li> <li>• Valve type (N.C. - Normally Closed / N.O. - Normally Open)</li> <li>• Input and output signal</li> </ul>	
<b>2</b>	<p><b>a. Check pressure rating</b></p> <p>Before installation, make sure that the pressure rating is in accordance with the safety factor of your application.</p> <p>The tested pressure is stated on the instrument with a red label. If this label is missing, or if the tested pressure is insufficient, the instrument must <b>not</b> be mounted in the process line and should be returned to the factory.</p>	



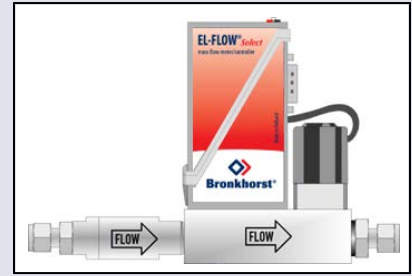
**b. Check operating conditions**

**EL-FLOW®** instruments are suitable for use at temperatures between -10 and +70 °C. The instrument housing has ingress protection rating IP40, implying that the equipment is suited for general purpose indoor (dry) applications, like laboratories and machine enclosures.

**3**

**Check if system piping is clean**

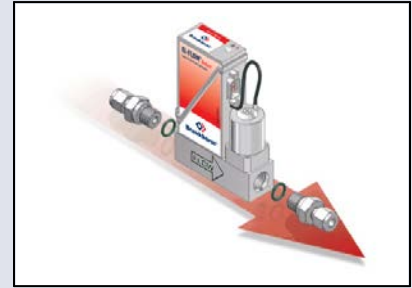
For reliable operation, always make sure the fluid stream is clean. Use filters to ensure a moisture, oil and particle free gas stream (recommended pore-size: 5 µm). If back flow can occur, the use of a downstream filter and a check valve is also recommended. Select a suitable filter size, to avoid a too high pressure drop.



**4**

**Install fluid connections**

Mount the instrument in the line in accordance with the flow arrow on the instrument body. Tighten the fluid connections according to the instructions of the supplier of the fittings. The use of Swagelok® RS-type stainless steel adapters is recommended.



Mounting the instrument in the upright position is preferred, especially if the operating pressure will be higher than 10 bar. When mounting the instrument in a position with upward or downward flow, adjusting the zero point is advised (see step 10).



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

**5**

**Leak check**

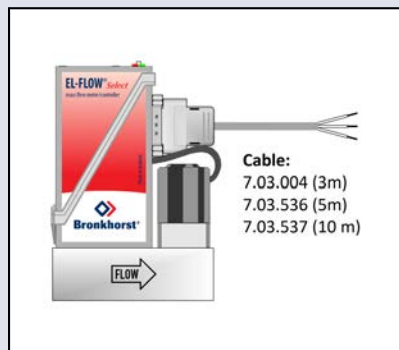
Check the fluid system for leaks before applying pressure, especially if toxic, explosive or other dangerous fluids are used.



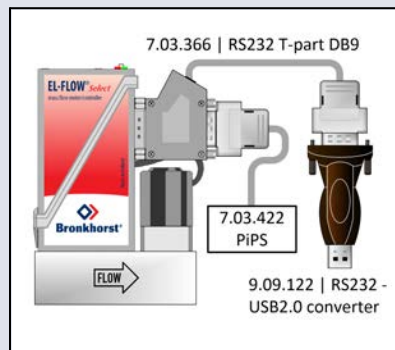
**6**

**Electrical connection**

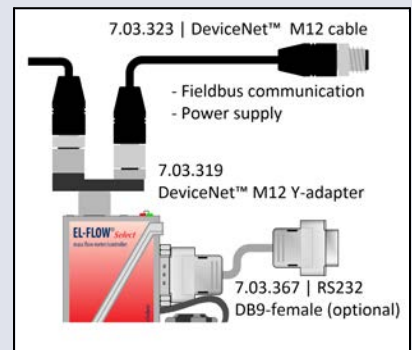
Electrical connections must be made with standard cables or according to the applicable hook-up diagram (see page 2): EL-FLOW® Select instruments are powered with +15...24 Vdc.



**A. Analog connection**

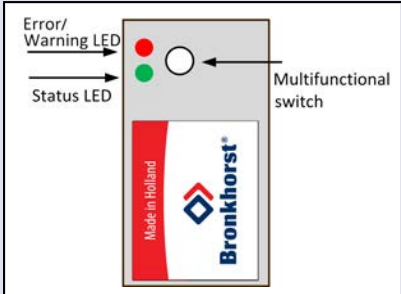


**B. Digital RS232 connection powered by plug in power supply**




**C. Fieldbus (e.g. DeviceNet™)**

<b>7</b>	<p><b>a. Analog/local operation</b> Connect the device to the power supply/readout unit using a cable with 9-pin D-sub connector. For controllers, the setpoint is proportional to the flow range. This principle also applies to digital operation.</p>
	<p><b>b. Digital RS232 operation</b> Connecting the instrument with an RS232 cable to a Windows computer enables operation using the free Bronkhorst® software for Windows, such as FlowDDE and FlowPlot. Consult the <b>EL-FLOW®</b> manual for more information.</p>
	<p><b>c. Fieldbus operation</b> Connect the instrument according to the specific fieldbus standard. Refer to the appropriate fieldbus hook-up document.</p>

<b>8</b>	<p><b>Multifunctional switch operation</b> Using the 2 LEDs and the switch on the <b>EL-FLOW®</b>, several instrument functions can be monitored and started. The green LED is used for status indication, the red LED is used for error and warning messages. The switch can be used to execute several functions, such as zeroing, bus initialization and restoring factory settings. Consult the <b>EL-FLOW®</b> manual for details.</p>	
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<b>9</b>	<p><b>Purging</b> If the instrument will be used with corrosive or reactive media, purging with an inert gas (e.g. Nitrogen or Argon) for at least 30 minutes is absolutely necessary before use. After use with such media, complete purging is also required before exposing the system to air.</p>
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	<p><b>Warm-up time</b> For accurate results, it is recommended to warm up the instrument for at least 30 minutes before starting measurement (this can be done while purging).</p>
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<b>10</b>	<p><b>Adjusting zero point</b> The zero point of each Bronkhorst® flow meter is factory adjusted. If required, the zero point can be re-adjusted via RS232 or with the multifunctional switch. Procedure for adjustment with the multifunctional switch:</p> <ul style="list-style-type: none"> <li>• Warm up and pressurize the system and fill the instrument according to the actual process conditions.</li> <li>• Make sure the flow through the instrument is blocked, by closing a valve immediately before or after the instrument.</li> <li>• Set the setpoint to 0%.</li> <li>• Press and hold the multifunctional switch. After a short time, the red LED will turn on and off, at which moment the green LED will turn on. At that moment (which is 8 seconds after pressing), release the switch.</li> <li>• The zeroing procedure will start and the green LED will blink fast. The zeroing procedure waits for a stable signal and saves the new zero point. Typically, this will take approximately 10 seconds. If the signal is unstable, the procedure can take longer and the nearest point to zero is accepted.</li> <li>• When the indication is showing 0% signal and the green indication LED is glowing continuously again, the zeroing action was successful.</li> </ul>
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Your **EL-FLOW® Select** is now ready for operation.

