

EL-FLOW[®] *Select*

Thermal Mass Flow Meters/Controllers

Quick Installation Guide

Doc. no.: 9.17.098A Date: 19-03-2018



Starting up EL-FLOW[®] *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. They offer great flexibility thanks to the "multibus" concept, whereby the instruments can be equipped with an on-board fieldbus interface. 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:

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

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

Interfaces

- Analog/RS232 interface
- DeviceNet™ interface
- EtherCAT® interface
- FLOW-BUS interface
- Modbus interface
- PROFIBUS DP interface
- PROFINET interface
- Custom bus & I/O configurations

Manual

- 9.17.027
- 9.17.026
- 9.17.063
- 9.17.024
- 9.17.035
- 9.17.025
- 9.17.095
- n/a

Hook-up diagram

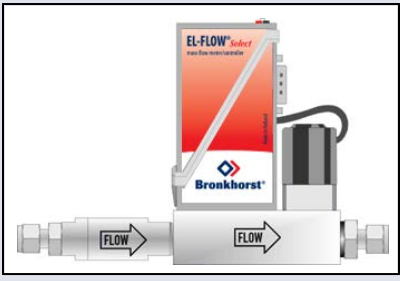
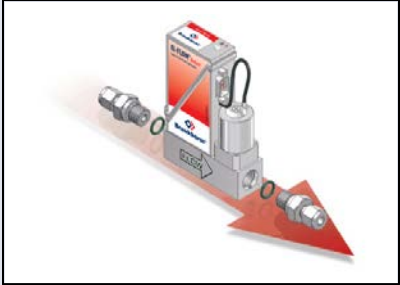




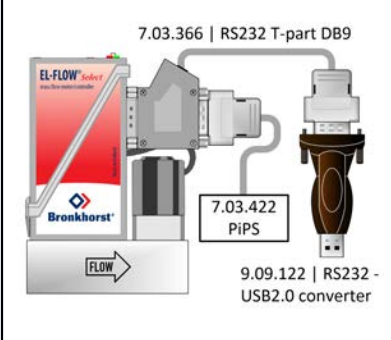
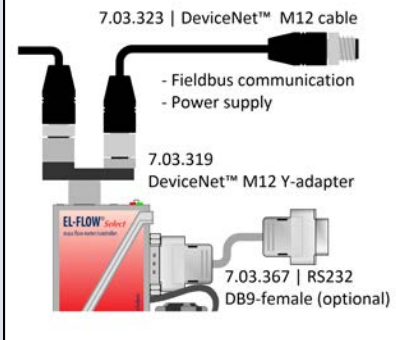
- 9.16.119
- 9.16.122
- 9.16.124
- 9.16.120
- 9.16.123
- 9.16.121
- 9.16.148
- 9.16.118



- 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
- Other documents can be found on our general download page (www.bronkhorst.com/downloads)

Starting up

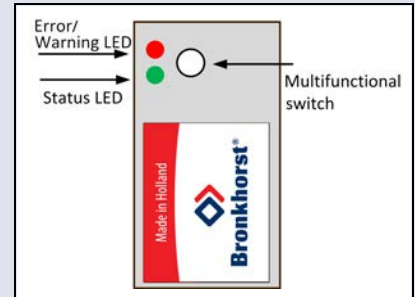
1	<p>Check functional properties</p> <p>Before installing the instrument, check if the properties stated on the instrument label match your requirements:</p> <ul style="list-style-type: none"> • Flow and/or pressure rate • Media to be used in the instrument • Upstream and downstream pressure(s) • Operating temperature • Valve type (N.C. - Normally Closed / N.O. - Normally Opened) • Input and output signal 	
2a	<p>Check test pressure</p> <p>Before installation, make sure that the test pressure is in accordance with the safety factor of your application.</p> <p>The test pressure is stated on the instrument with a red label. If this label is missing, or if the test pressure is insufficient, the instrument must not be mounted in the process line and should be returned to the factory.</p>	
2b	<p>Check operating conditions</p> <p>EL-FLOW® instruments are suitable for use at temperatures between -10 and +70 °C. Please note that EL-FLOW® instruments have an ingress protection rating of IP40, implying that the electronics housing and electrical connection do not offer any protection against moist environments.</p>	

<p>3</p>	<p>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.</p>	
<p>4</p>	<p>Mounting/installing Install the instrument in the line in accordance with the flow arrow on the instrument body. Tighten fittings according to the instructions of their supplier. The use of Swagelok RS-type stainless steel adapters and Bronkhorst® elastomer O-rings is recommended.</p>	
	<p>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).</p>	
	<p>Avoid installation in close proximity of mechanic vibration and/or heat sources.</p>	
<p>5</p> 	<p>Leak check Check the system for leaks before applying (fluid) pressure, especially if toxic, explosive or other dangerous fluids are used.</p>	
<p>6</p>	<p>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.</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="245 1288 639 1632">  <p>A. Analog connection</p> <p>Cable: 7.03.004 (3m) 7.03.536 (5m) 7.03.537 (10 m)</p> </div> <div data-bbox="662 1288 1057 1632">  <p>B. Digital RS232 connection powered by plug in power supply</p> <p>7.03.366 RS232 T-part DB9 7.03.422 PiPS 9.09.122 RS232 - USB2.0 converter</p> </div> <div data-bbox="1079 1288 1479 1632">  <p>C. Fieldbus (e.g. DeviceNet™)</p> <p>7.03.323 DeviceNet™ M12 cable - Fieldbus communication - Power supply 7.03.319 DeviceNet™ M12 Y-adaptor 7.03.367 RS232 DB9-female (optional)</p> </div> </div>	
<p>7a</p>	<p>Analog/local operation 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>7b</p>	<p>Digital RS232 operation Connecting the instrument with an RS232 cable to a Windows computer enables the use of the free Bronkhorst® software for Windows, such as FlowDDE and FlowPlot. Consult the EL-FLOW® manual (document no. 9.17.099) for further explanation on RS232 operation.</p>	
<p>7c</p>	<p>Fieldbus operation Connect the instrument according to the specific fieldbus standard. Refer to the appropriate fieldbus hook-up document mentioned on page 2.</p>	

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Multifunctional switch operation

Using the 2 LEDs and the switch on the **EL-FLOW**[®], several actions 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 **EL-FLOW**[®] manual (document no. 9.17.099) for details.



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Purging

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 these media, complete purging is also required before exposing the system to air.



Warm-up time

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).

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Adjusting zero point

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:

- Warm up and pressurize the system and fill the instrument according to the actual process conditions.
- Make sure no flow is going through the instrument, by closing a valve near the instrument.
- Set the setpoint to 0%.
- Press and hold the multifunctional switch. After a short time, the red LED will turn on and off, after which the green LED will turn on. At that moment (which is 8 seconds after pressing), release the 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 new zero point. Typically, this will take approximately 10 seconds. If the signal is unstable, the procedure will take longer and the nearest point to zero is accepted.
- When the indication is showing 0% signal and the green indication LED is glowing continuously again, the zeroing action was successful.

Your **EL-FLOW**[®] **Select** is now ready for operation.

