

# IQ+FLOW®

Micro Fluidic Mass Flow and Pressure Meters/Controllers  
Single- and Multi-channel

## Quick Installation Guide

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Starting up the IQ+FLOW® in 10 steps

# SCOPE OF THIS GUIDE

**IQ+FLOW®** Micro Fluidic Mass Flow and Pressure Meters/Controllers for gases belong to the smallest chip based instruments of its kind. **IQ+FLOW®** mass flow meters/controllers can be applied for measuring and fast control of gas flows up to 5000 mln/min, for applications with pressure conditions up to 10 bar (145 psi) and temperatures between 5 and 50 °C (41 to 122 °F). **IQ+FLOW®** pressure meters/controllers can be applied for pressure ranges from 0,01...0,5 bar up to 0,2...10 bar. The instruments can either be operated in analog or digital mode (RS232 or RS485).

This Quick Installation Guide will help you start up your **IQ+FLOW®** in only 10 steps, covering the following subjects:

- |                                |                          |
|--------------------------------|--------------------------|
| 1. Check functional properties | 6. Electrical connection |
| 2. Check pressure              | 7. Operational interface |
| 3. Check piping                | 8. Hardware interface    |
| 4. Mounting/installing         | 9. Purging               |
| 5. Leak check                  | 10. Zeroing              |


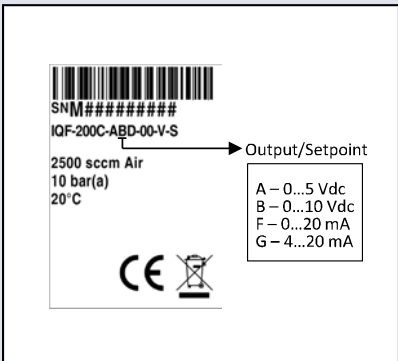

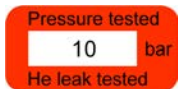
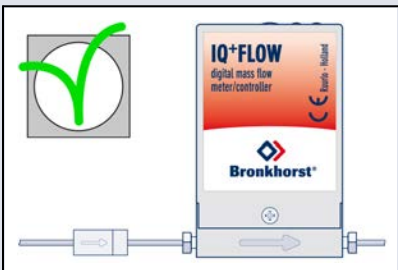
## Other applicable documents:

- Instruction Manual for IQ+FLOW® series 9.17.045
- Instruction Manual FlowPlot 9.17.030
- Hook-up diagram IQ+FLOW® Single-channel 9.16.101
- Hook-up diagram IQ+FLOW® Multi-channel 9.16.090



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

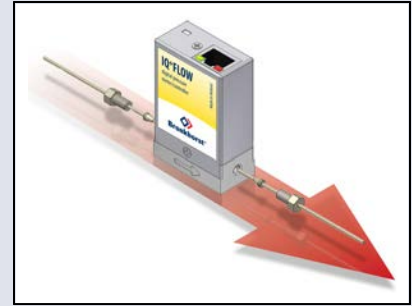
## Starting up

<b>1</b>	<p><b>Check functional properties</b> Before installing the instrument, check if the properties stated on the serial number label match your requirements:</p> <ul style="list-style-type: none"> <li>• Instrument type             <ul style="list-style-type: none"> <li>○ gas flow (red label) or</li> <li>○ pressure (yellow label)</li> </ul> </li> <li>• Flow rate</li> <li>• Fluid to be measured</li> <li>• Upstream and downstream pressures</li> <li>• Input/output signals</li> <li>• Temperature</li> </ul>	 
	<ul style="list-style-type: none"> <li>• IQ+FLOW® gas flow instruments are designed for dry, clean, non-corrosive gases</li> <li>• IQ+FLOW® pressure instruments are designed for dry, clean, non-corrosive, non-flammable gases</li> </ul> <p>Do not use the IQ+FLOW® for other gas types.</p>	
<b>2</b>	<p><b>Check test-pressure</b> The tested pressure is stated on the instrument with a red label. Before installation, make sure that the tested pressure is in accordance with normal safety factors for your application. If a pressure test 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>3</b>	<p><b>Check if system piping is clean</b> For reliable measurement, always make sure the fluid stream is clean. Use filters to assure a moisture, oil and particle free gas stream (recommended pore-size: 7 µm). If back flow can occur, installing a downstream filter and a check valve is recommended too. For high flow rates, select a suitable filter size, to avoid a too high pressure drop.</p>	

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**a. Mount/install instrument properly**

- For IQ+FLOW® the upright position is preferred. When mounting an instrument in a vertical position (flow going upward or downward), zeroing of the instrument is advised (see step 10).
- The housing of the instrument is according to class IP40, which means that the instrument is suitable for indoor (dry) applications, like laboratories or well protected (OEM) housings.



Mount the instrument in the line in accordance with the flow arrow on the instrument body. If applicable, tighten fittings according to the instructions of their supplier. Special types of fittings are available on request.



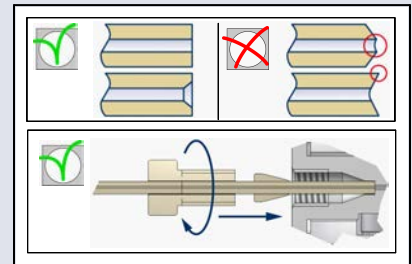
Avoid installation in close proximity of mechanic vibration and/or heat sources.

**b. Compression type fittings**

For leak tight installation of compression type fittings make sure that the tube is inserted up to the shoulder in the fitting body and that no dirt or dust is present on tube, ferrules or fittings. Tighten the nut finger tight; while holding the instrument, then tighten the nut one turn.

**c. 10-32 UNF fittings**

Tighten the 10-32 UNF fittings according to the instructions of their supplier.  
Only use 1/16" tubing with a straight and clean cut without burrs to ensure leak tightness. Preferably deburr the tubing prior to installation. A new ferrule connection must be made for each new adapter to ensure leak-tightness and minimum dead volume, due to variances in the adapter dimensions.



**d. Mounting downported instruments**

For downported instruments make sure that the seals are present at the bottom, that the surfaces are undamaged and that they are dry and free from dirt or dust.

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**Leak check**

Check the fluidic system for leaks before applying pressure, especially when using hazardous media (e.g. toxic or flammable).

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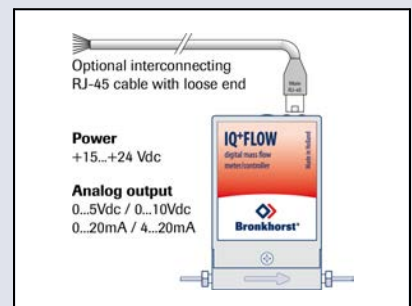
**Electrical connection**

Electrical connections must be made with a standard cable or according to the IQ+FLOW® hook-up diagram. These diagrams can be found on the "Documentation and software tools" CD-ROM and at [www.bronkhorst.com/downloads](http://www.bronkhorst.com/downloads). IQ+FLOW® instruments are powered with +15...+24 Vdc.

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**a. Analog/local operation (single-channel versions only)**

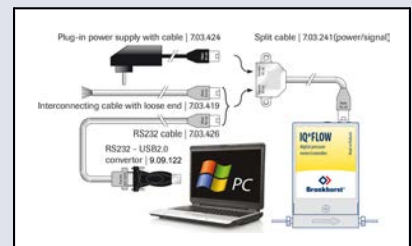
For analog operation refer to the "Hook-up diagram IQ+FLOW®" or use an RJ45 loose-end cable (7.03.419) to connect the required signals.



**b. Digital RS232 operation**

Connecting the instrument with an RS232 cable to a PC will enable you to use the (free) Bronkhorst® software for Windows, such as FlowDDE and FlowPlot.

See the IQ+FLOW® manual (document number 9.17.045) for further explanation on RS232 operation of the IQ+FLOW®.



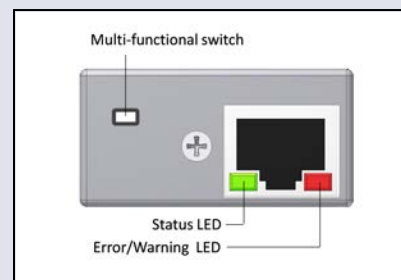
### c. Fieldbus operation (RS485)

With digital operation over RS485 a bus-system with multiple instruments can be set up. Refer to the "Instruction Manual IQ+FLOW® series" for possible systems.

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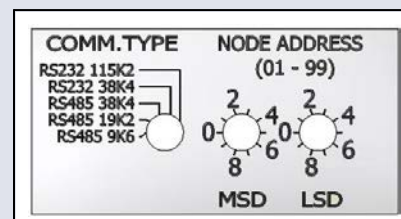
#### a. Multifunctional micro switch operation (single-channel versions only)

Using the 2 LEDs and the switch on the IQ+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 auto-zero and restoring factory settings. See the IQ+FLOW® manual (document number 9.17.045) for details.



#### b. Rotary switch operation (multi-channel versions only)

Select the communication type and Baud rate with the "COMM. TYPE" switch. Select the node address with the "MSD" and "LSD" switch (e.g. MSD = 1 and LSD = 9 selects node 19 for channel 1, but also node 20 and 21 for channels 2 and 3). See section 3.3 of the Instruction Manual for more details.



Unless specified otherwise, the IQ+FLOW® instrument is set for RS232 communication at 38k4 baud on node address 03 by default.



Do not apply pressure until electrical connections are made. When applying pressure to the system, avoid pressure shocks in the system and increase pressure gradually. Also decrease pressure gradually when required.

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#### Purging

In systems for use with corrosive or reactive media, purging for at least 30 minutes with a dry, inert gas (like Nitrogen or Argon) is absolutely necessary before use. After use with corrosive, reactive or hazardous media (e.g. toxic or flammable), purging is also necessary before the system is exposed to air.



#### Warm-up time

For accurate measurement, it is recommended to warm up the instrument for at least 30 minutes. This can be done with or without media flow (e.g. while purging).

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#### Zeroing (only flow meters/controllers)

The zero point of each flow meter is factory adjusted. If required the zero point can be re-adjusted over RS232 or by means of using the multifunctional switch. Procedure for zeroing by-micro switch:

- Warm up and pressurize 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 the multifunctional switch and hold it. After a short time, the red LED will go ON and OFF, then the green LED will turn ON. At that moment, 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 zero. If the signal is not stable, zeroing will take long and the nearest point to zero is accepted. The procedure will take approximately 10 seconds.
- When the indication is showing 0% signal and the green indication LED is glowing continuously again, then the zeroing action was successful.

Your ***IQ+FLOW***® is now ready for operation.

