



FLUIKA® Miniature Pneumatic Control Kit

General User's Manual

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Disclaimer

We ("Fluika OÜ") believe that our products are safe, while used in the intended manner and under normal conditions. However it is entirely your ("Buyer's") responsibility to ensure safety of your application, setup or eventual system, where our products have been used as components. As well as it is your responsibility to ensure, that your eventual system meets with your specification. Our products are not intended for critical applications, where failure of the device may result in hazard to life or compromise any other ways safety of person or property (Life support and safety applications). Any unintended use is entirely at the risk of buyer, where we have no liability. We disclaim all liability arising from this information and its use.

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IMPORTANT

Due to constant development of our devices, upgraded firm- and software, your actual device or software behavior may differ from that in this documentation. Therefore it is important to obtain latest documentation from our web site (www.fluika.com). All documents are indexed and named FD followed by three digit document number and eventually version number (eg. "FD001-v2.pdf"). Also source codes, project examples and tutorial videos can be found on our web site.

CONTENT

This document contains general information of FLUIKA® Miniature Pneumatic Control Kit ("FLUIKA Kit"). This information is universally valid for all of its components describing:

- Overview and intended use
- Application conditions and safety
- Installation
- USB Communication
- Troubleshooting
- Disposal
- General specification

OVERVIEW AND INTENDED USE

FLUIKA™ Kit has been developed to provide easy to handle components for rapid implementation of miniature pneumatic control systems. Kit contains components to generate and control vacuum and pressure, actuate solenoid valves and monitor pressures. These devices, small in foot print, can be solely powered and controlled through computer USB port, making it extremely easy to interface. These devices are intended for research and educational purposes, where rapid implementation and testing of new control systems is needed.

Typical application areas are:

- Microfluidic and lab on a chip technology (pressure driven flow)
- Automation in chemistry and biology (eg. superfusion, dispensing)
- Miniature robotics and mechatronics

This kit is intended for:

- Research
- Rapid prototyping
- Small scale and test production
- Education in chemistry and robotics



This kit is for research or educational purposes only!
It is not for any clinical or life supporting use!
It is not for any safety applications!

Kit contains following components are:

- Pressure Generator (PG)
- Vacuum Generator (VG)
- Vacuum-Pressure Generator (VPG)
- Valve Controller (VC)

Each component may have different models with different specification and ratings (eg. different pressure ranges). For specific information see individual datasheets of the component! Also custom components are possible.

APPLICATION CONDITIONS AND SAFETY

All components of FLUIKA® Miniature Pneumatic Control Kit (“FLUIKA Kit”) are only for pneumatic purposes and shall be operated with dry air. **It is very important to avoid any liquid entering to the devices.** Liquids can break the device. Especially sensitive are vacuum and pressure generators, which have sensitive pressure sensors inside. Warranty is void, if device has become damaged after exposure to liquid. It is especially critical to pay attention to it, when vacuum generator has been used for flow driving applications. Make sure, that reservoirs are sufficiently large, not to allow suction of liquid into vacuum generator.

Never use FLUIKA devices with other gases than air! Using hazardous (toxic or explosive) gases may expose great danger to you (operator)! Using corrosive gases can damage the device.

Never over pressurize FLUIKA devices! Most components of FLUIKA kit can be safely combined with each other, but always read specification for maximum pressure ratings. Great caution must be taken, while combining FLUIKA devices with external pressure sources, in order not to exceed pressure limits. FLUIKA device may not be safe, if exposed to pressures higher than rated! Exceeding pressure limits can also permanently damage the device. Warranty is void, if device has become damaged after exposure to over pressure.

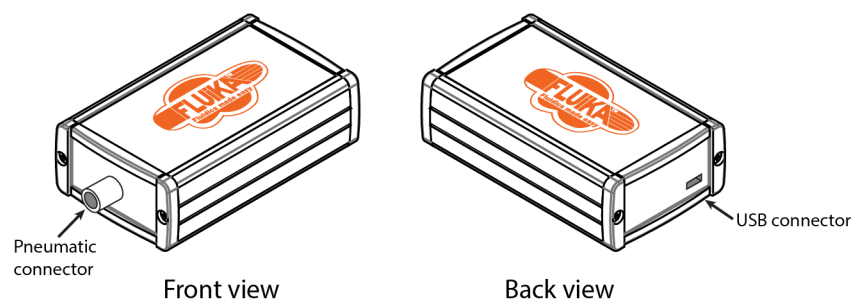
Fluika devices are intended for indoor laboratory usage. Temperature range: 18-28°C. Relative humidity: <75%.

INSTALLATION

In the package of every Fluika component you will find:

- Fluika component
- USB cable
- General user’s manual
- Pneumatic accessories (Plugs, tubes etc. It is depending on component)

Connecting Fluika component:



All components of Fluika kit have same enclosure, where on the front side one can find One-Touch Pneumatic connector(s), which allow fast and reliably attaching and detaching 4mm O.D tubing or plug-in fittings.

On the backside USB 2.0 connector (USB mini-B connector) can be found.

USB COMMUNICATION

Fluika components are fully controlled and powered through USB port. Since the device is also powered through USB, **it is important to connect devices directly to computer or use powered USB hubs with current rating 500mA/port! Do not use unpowered USB hubs, they cannot provide sufficient power to operate Fluika devices!**

Currently device drivers are provided for Windows XP, Vista and 7. Both 32/64 bit operating systems are supported. Fluika devices are working also on Mac OS X (Tested version 10.9), however limited set of control software might be available on Mac OS X.

USB device parameters are: vendor ID: 04D8 and product ID: F882

Detailed installation description for Windows 7 can be found in document [FD002](#)

After installation Fluika devices appear as COM ports. COM ports are convenient, since they are easily accessible in various programming environments and fast testing can be done without any programming, by using terminal program only. You need to install Fluika driver only once per computer! All Fluika components use same driver.

List of commands and syntax can be found in manuals of respective components.

Graphical user interfaces and detailed programming examples in various languages can be found on our home page (www.fluika.com)

USB communication is convenient for both standalone use, but also for building new devices, where several Fluika components are connected together into a new computer controlled instrument. For example, in order to create a custom pneumatic controller, Fluika components can be assembled and new device can be equipped with powered USB hub, where all components are plugged-in.

TROUBLESHOOTING

USB communication problems

Problem: Data transmission error, sensor reading error, connection loss or some other abnormalities occur, when multiple Fluika components are connected or activated.

Reason: Most likely reason is lack of electrical power through USB

Solutions: check that your USB hub has required current rating! Never connect multiple Fluika devices to USB hub without external power supply. With powered USB hubs, check that power supply is rated for sufficient current. Current rating should be equal or larger than 0.5A x number of port on hub. Try to connect devices to different USB ports/hubs.

SERVICE AND CUSTOMER SUPPORT

In case of technical problem see section “Troubleshooting” in this general document or in the specific manual of respective component, to see if you can resolve the problem yourself.

In case of device defect, please contact our technical support and repair through our website’s technical support section, at: www.fluika.com

WARNING! Under any circumstances, never make any repairs yourself! Any attempted repair or opening of the device will result in the loss of any guarantee rights! Only have Fluika components repaired through our repair center.

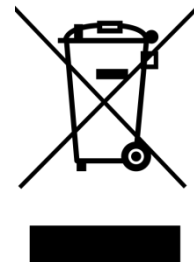
DISPOSAL

Dispose Fluika component according to regulations valid in your country for electronic waste!

Never put the Fluika component into the normal household waste!

In the member countries of European Union:

According to European Union (EU) guidelines, Fluika OÜ takes back old devices, with the member countries of EU and disposes them properly. These devices are marked with sign shown right. For return procedure contact Fluika through our website: www.fluika.com



GENERAL SPECIFICATION

Pneumatic connector: SMC One-Touch Fitting for 4mm O.D. tubing

USB connector: USB mini-B (female)

Device dimensions: 31 mm x 60 mm x 100 mm (enclosure) or 31 mm x 60 mm x 110 mm (together with pneumatic connectors)

Characteristic	Typical	Minimum	Maximum	Unit
Operating pressure <i>(unless specified otherwise!)</i>	500			mbar
Over pressure <i>(pressure which can be applied, without causing leaks or other damage to the device)</i>			1000	mbar
Supply voltage (through USB)	5.0	4.5	5.3	V
Supply current (through USB)			500	mA

- Individual specification of different components can be found in their respective manuals.

Before operation please read also specification and instructions of each component!

DECLARATION OF CONFORMITY

We

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Hereby declare that the product **FLUIKA Miniature Pneumatic Control Kit** complies with essential safety requirements, provided that the restrictions stated in the operating manual are observed. The following standards were used to evaluate the product:

EN61010-1:2010 "Safety requirements for electrical equipment for measurement, control and laboratory use"

EN61326-1:2006 "Electrical equipment for measurement, control and laboratory use – EMC requirements — Part 1: General requirements"