



MCQ INSTRUMENTS

# GAS BLENDER 15K (2 Channels)

Family name: GB2000 Series

GETTING STARTED - Rev. 05

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## ESSENTIAL INSTRUCTION

### **Read carefully before proceeding!**

MCQ INSTRUMENTS tests its products to meet many national and international standards. For these instruments are sophisticated technical products, proper install, use and maintenance are required to ensure their right functioning. The following instructions must be adhered to and integrated into your safety program when installing, using and maintaining MCQ INSTRUMENTS products.

### ESD (Electrostatic Discharge)







This instrument contains electronic components that are susceptible to damage by static electricity. Proper handling procedures must be observed during the removal, installation and other handling of circuit boards or devices.

Handling procedures:

- Power to unit must be removed.
- Personnel must be grounded, via a wrist strap or other safe, suitable means before any circuit card or other internal device is installed, removed or adjusted.
- Printed circuit cards must be transported in a conductive container. Board must not be removed from protective enclosure until immediately before installation. Removed boards must immediately be placed in protective container for transport, storage or return to factory.

## PRE-INSTALLATION CHECK-LIST

### **WARNING!**

1. Double check that gas to be measured are compatible with the instrument.
2. The use of appropriate tubes is strongly recommended for the right functioning of the instrument.
3. No need for pipes installation.
4. This instrument has internal filters.
5. The instrument has specific power supply requirements.
6. 110-240 Vac / 50-60 Hz
7. Do not locate the instrument in areas subject to sudden temperature changes, excessive moisture or near equipment radiating significant amount of heats.  
Moreover, be sure to allow adequate space for cable connectors and wiring.
8.  The instrument must be used under suction hood.
9.  **Purge:** In case of use of any gas different from N<sub>2</sub>, or He, or AIR it is mandatory to purge all system's pipes with N<sub>2</sub> for at least 30 min before and after use, in order to avoid moisture residues that can damage the instrument, activating corrosion effects, etc.
10.  If you use flammable gases (CH<sub>4</sub>, H<sub>2</sub>) be sure that the suction hood is ATEX type.
11.  Maximum inlet gas pressure is 3 bar.

## WARNING AND IMPROPER USE



Do not modify the device or substitute parts

The improper use of the Gas Blender could compromise the expected protection

Service by qualified personnel only

Do not use any type of liquids in the tubes

Do not use aggressive gases (e.g. H<sub>2</sub>S)

Do not step on the device

Do not power the device with different voltages than those indicated (110-240 Vac 50/60Hz)

Do not operate at pressures higher than the rated maximum pressure

Use flammable gases (e.g. H<sub>2</sub>, CH<sub>4</sub>) only under a proper atex ventilation hood

Use dangerous gases (e.g. CO<sub>2</sub>, CO, NO<sub>x</sub>) only under a ventilation hood

Purge: In case of use of any gas different from N<sub>2</sub>, or He, or AIR it is mandatory to purge all system's pipes with N<sub>2</sub> for at least 30 min before and after use, in order to avoid moisture residues that can damage the instrument, activating corrosion effects, etc.

Do not place fluid containers above the device

## 1. GAS BLENDER 15K (2 Channels) HARDWARE INSTALLATION



Before connecting the gas through the equipment, please verify that the gas pressure set on cylinder pressure regulator is compatible with the instrument specifications (see the PERFORMANCE SPECIFICATIONS, page 15).



This section provides a simple step-to-step method for a quick and safe installation of the Gas Blender.

- 1. Gas cylinders** - Close the cylinder's main valve. Take a 6 mm external diameter tube and proceed connecting it to the cylinder pressure regulator. For a safe connection, a specific rubber holder adapter is usually required (Fig. 1). This procedure must be repeated for each gas cylinder in use.

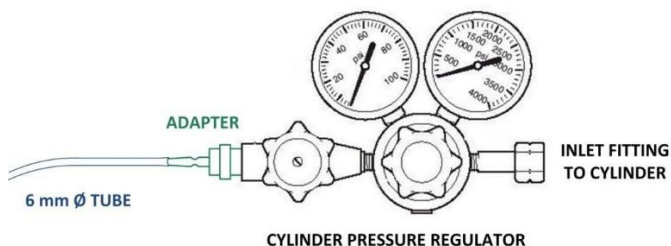


Figure 1

- 2. One Touch Valves** - Install the One Touch Valves (provided in the package) along the gas line for each of the gas source in use (Except for CO<sub>2</sub>). In order to do so, take the free end of the tube previously connected to the pressure regulator and insert it in the valve through the push-in connector. In case of different valves type use, please contact the MCQ INSTRUMENTS support center.

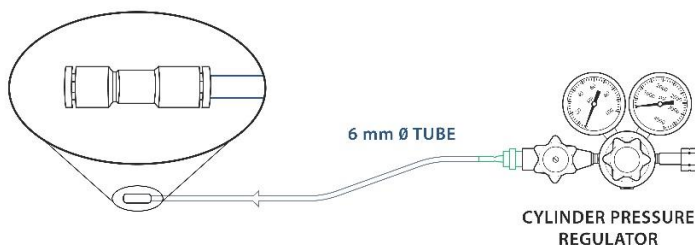


Figure 2

- 3. Check valves (Only for CO<sub>2</sub>)** - Install the Check valve (provided in the package) along the gas line of CO<sub>2</sub> gas source in use. In order to do so, take the free end of the tube previously connected to the pressure regulator and insert it in the check valve through the push-in connector. Check valves allows the gas to flow through them in only one direction. Therefore, the check valves must be installed in the direction of flow sense, i.e. form the cylinder to the Gas blender (Fig. 3). In case of different valves type use, please contact the MCQ INSTRUMENTS support center.

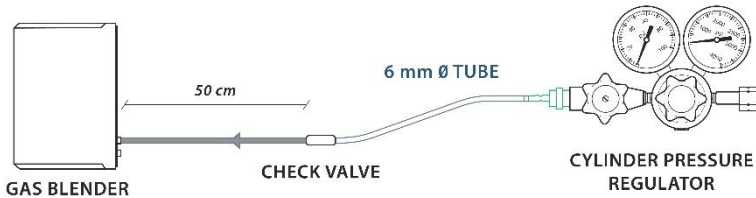


Figure 3

- 4. Gas Blender Inlets** - Valves must be positioned at a distance of 50 cm from the Gas Blender inlets to secure a proper working of the instrument. For this purpose, two 6mm diameter tubes 50 cm long, on different colors based on the gas type, are provided in the package. Take the 50 cm long tube and connect one end with the valve. Then connect the other end to the instrument inlet with same color, positioned on the Gas Blender rear panel (Fig. 4). This procedure must be repeated for each gas cylinder in use.

*Example: Channel 1 calibrated on N<sub>2</sub>, channel 2 calibrated on O<sub>2</sub>, channel 3 calibrated on CO<sub>2</sub>:*



Figure 4: Inlets

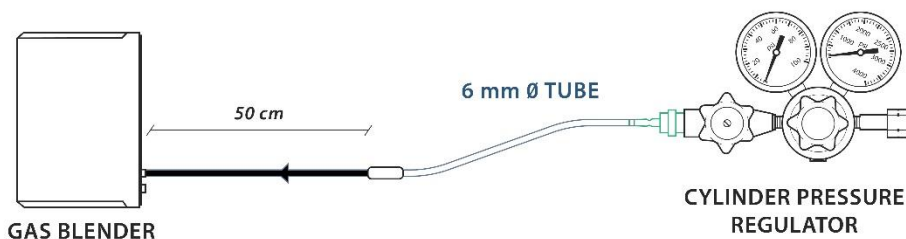


Figure 5: N2

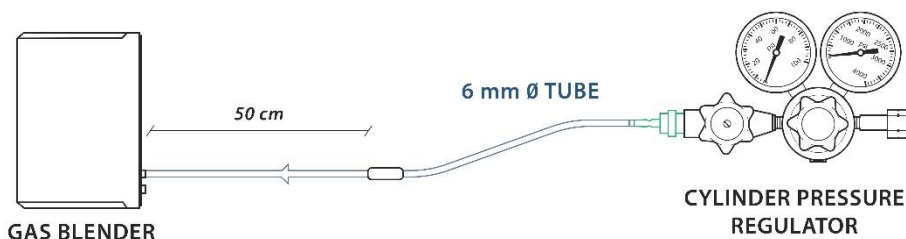


Figure 6: O2

Note: Colors:

N2: Black tube

O2: White tube

Air: Green tube

CO2: Grey tube

H2, CH4, Flammable gases: Red tube

Other Gases: Yellow tube

Note: For Swagelok connections, please look at the video provided in the USB pen.

- Gas Blender Outlet** – Another One Touch valve must be positioned at a distance of 50 cm from the Gas Blender outlet to secure a proper working of the instrument. Take the 50 cm long tube and connect one end with the valve, then connect the other end to your system, as shown in the pictures below (Fig. 8).

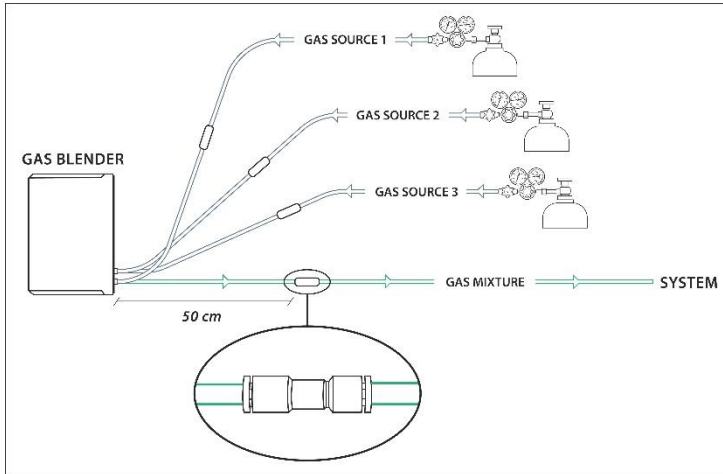


Figure 7

6. **Power** - Connect the bundled power cord to the back dedicated plug of the instrument. Make sure the power plug is connected securely to the instrument. Then, plug the unit into an electrical outlet. Turn on the switch.
7. **Console** - Connect the Gas Blender to you PC with the USB cable (provided with the instrument).



# GAS BLENDER 15K (2 Channels) SOFTWARE INSTALLATION

## Gas Mixture Creator

### BEFORE YOU BEGIN:

#### Gas Mixture Creator compatibility

The MCQ INSTRUMENTS Gas Mixture Creator is compatible with the following Microsoft Operative Systems:

- **Windows ® XP Home edition with Service Pack 3 or more**
- **Windows ® XP Professional with Service Pack 3 or more**
- **Windows ® Vista**
- **Windows ® 7**
- **Windows ® 8**
- **Windows ® 8.1**
- **Windows ® 10**
- **Windows ® 11**

#### NET Framework 3.5 installation required

To use the MCQ INSTRUMENTS Gas Mixture Creator, the Microsoft .NET Framework 3.5 (or higher) must be installed on your computer. Visit the Microsoft official website, download and install the .NET Framework 3.5 (or higher) version. Installing the .NET Framework libraries will let you work with the Gas Mixture Creator and with all the software designed for the .NET Framework platform.

#### Gas Mixture Creator Software installation

The MCQ INSTRUMENTS Gas Mixture Creator is a unique and fundamental tool provided by MCQ INSTRUMENTS for the GAS BLENDER 15K (2 Channels) control.

In order to install the software, put the MCQ INSTRUMENTS Gas Mixture Creator Installation USB (provided in the package) in your USB port, navigate to the USB directory, double click on it and then follow the simple installation steps. (Fig. 9-10-11)

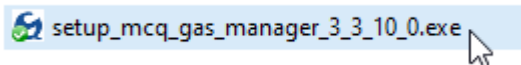


Figure 8

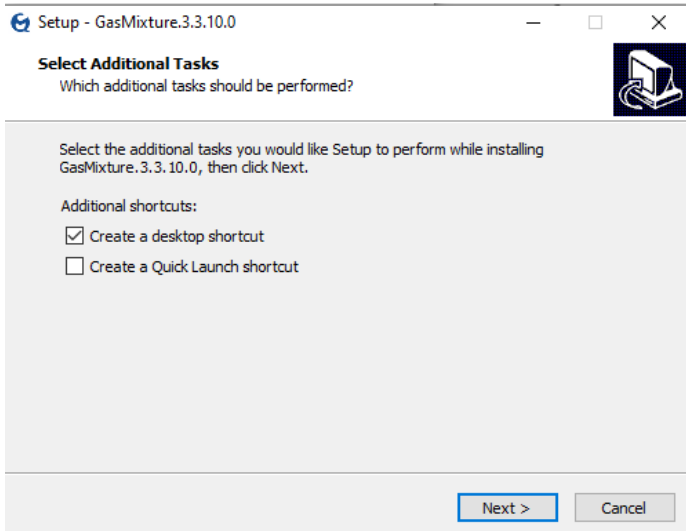


Figure 9

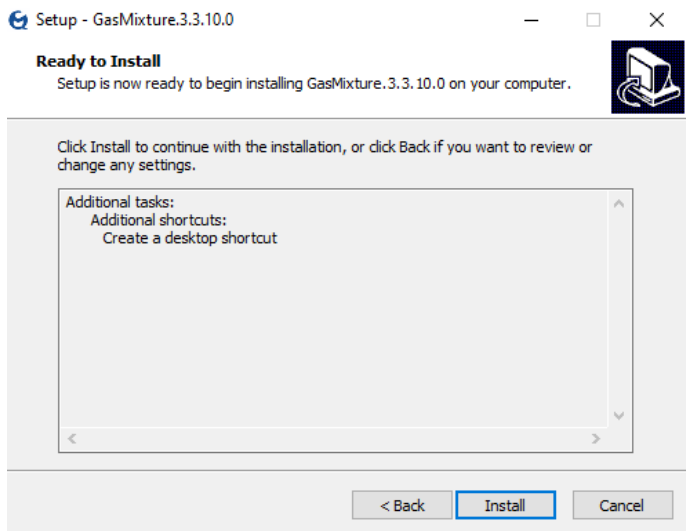


Figure 10

## MCQ INSTRUMENTS

Launch the software double-clicking on the MCQ INSTRUMENTS Gas Mixture Creator's shortcut icon located on your desktop. Copy the "KEY PRO SOFTWARE" provided in the USB pen (Fig. 12) and press "Ok".

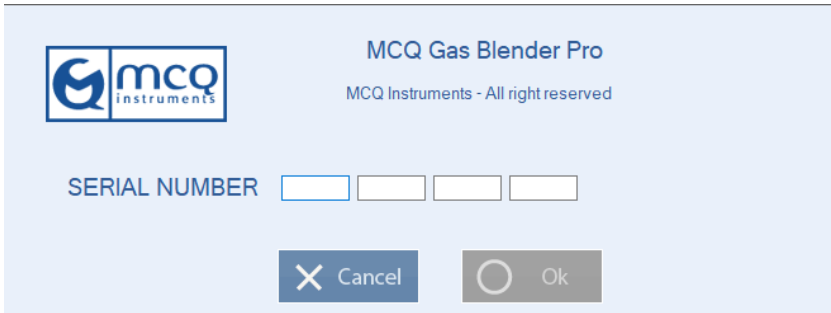


Figure 11

## GAS BLENDER 15K (2 Channels) CONSOLE CONNECTION

After the MCQ INSTRUMENTS Gas Mixture Creator installation, select the proper driver for your computer (Fig. 13).

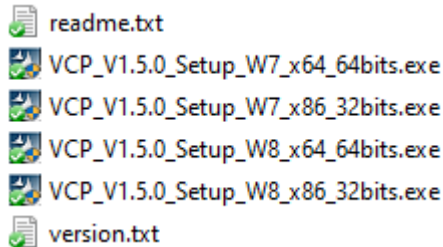


Figure 12

In order to install the driver, follow the simple step-to-step guide (optimized for **Windows 10** users) provided in this section (Fig. 14-16).

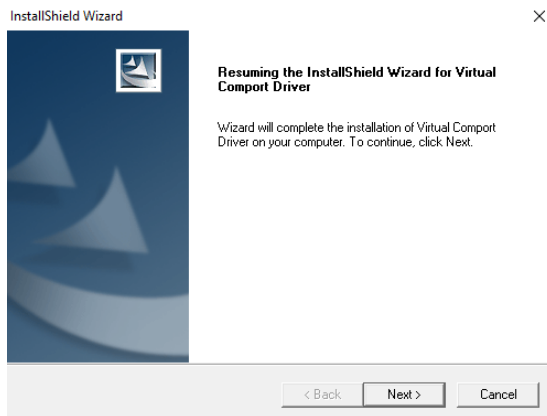


Figure 13

Installazione guidata driver di periferica

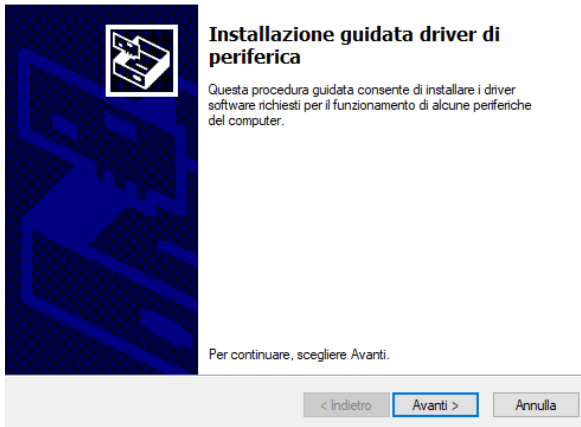


Figure 14

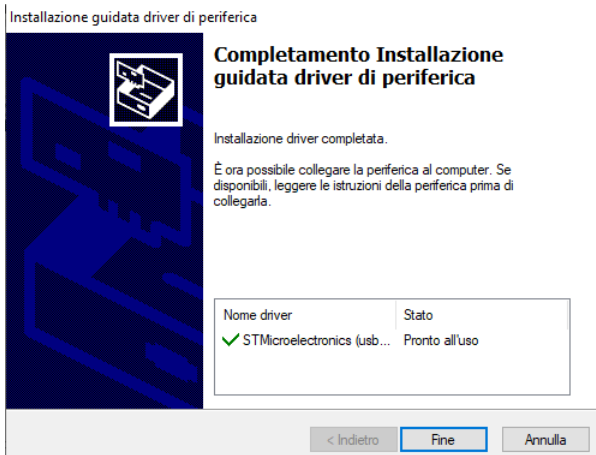



















Figure 15

After the MCQ INSTRUMENTS Gas Mixture Creator installation the Gas Blender must be connected to your console.

- **Power Cord** - Connect the bundled power cord to the back dedicated plug of the instrument, then turn on the instrument.
- **USB** - Connect the instrument to your console via the USB cable provided in the package. After this operation, you can use the instrument and the Gas Mixture Creator Software.

## GAS MEDIA COMPATIBILITY

The MCQ INSTRUMENTS GAS BLENDER 15K (2 Channels) incorporates components made of non-reactive material that are compatible with a wide variety of gaseous media. This Appendix provides a list of non-corrosive gases compatible with the instrument.

<b>Gas Media</b>	<b>MCQ GAS BLENDER 15K (2 Channels)</b>
Air	
Nitrogen	
Oxygen	
Argon	
Natural Gas	
Nitrous Oxide	
Anesthetic Gasses	N/A
Carbon Dioxide	
Hydrogen	
Helium	
Methane	
Ethylene	
Ethane	
Sulfur Hexafluoride	
Propane	
Butane	
DME (C <sub>2</sub> H <sub>6</sub> O)	
Tetrafluoropropene HFO1234ze	
Nitrous Oxide	Dry Gas Only
Nitric Oxide	Dry Gas Only
Sulfur Oxide	Dry Gas Only
Water Vapor	Non-condensing
Ammonia Gas	Dry Gas Only, <0,1%
Chlorine Gas	<0,1%
Hydrogen Sulfide	<0,1%

## COMPATIBLE TUBES LIST

This appendix provides you a list of tube compatible with the MCQ INSTRUMENTS GAS BLENDER 15K (2 Channels). For your laboratory applications involving the Gas Blender the following type of tube can be used:

- **Polyurethane (SMC TU Series)**
- **Fluorinated Ethylene Propylene (FEP)**
- **Stainless Steel (only with Swagelok)**

## PERFORMANCE SPECIFICATIONS

In this appendix, the GAS BLENDER 15K (2 Channels) internal and external working specifications are listed. Use this performance specifications to ensure a safe and proper use of the Gas Blender. MCQ INSTRUMENTS is not responsible for any instrument damage caused by an inappropriate use of the instrument itself.

### Internal specifications

<b>Accuracy</b>	N <sub>2</sub> , 20°C, 101.325 KPa (1 atm) 10-100% FS: 0,2% of FS <10% FS: 1% of FS
<b>Repeatability</b>	0.10% of reading
<b>Response time (for each channel)</b>	N <sub>2</sub> , 20°C, 101.325 KPa (1 atm) 5-100% FS: < 3000 ms <5% FS: up to 15000ms
<b>Channel step regulation</b>	1% from touch panel 0,1% from software PC
<b>Power Supply Requirements</b>	Internal, power cord in bundle 110-240 Vac / 50-60 Hz
<b>Main Supply Voltage Fluctuations</b>	±10%
<b>Operating Pressure</b>	Max 3 bar
<b>Working Temperature</b>	15-45 °C

### Environmental specifications

<b>Operating Temperature Range</b>	15-45 °C
<b>Optimal Pressure</b>	100 kPa (1 bar)
<b>Optimal Humidity</b>	30 to 50 % relative humidity
<b>Maximum Operative Altitude</b>	2000 m

## Size and Weight

<b>Length</b>	25,5 cm
<b>Height</b>	10,5 cm
<b>Depth</b>	28,7 cm
<b>Weight (GB2000)</b>	3 kg

## OPERATING SPECIFICATIONS

In this appendix, the GAS BLENDER 15K (2 Channels) operating specifications are listed. These specifications must be followed to ensure the proper use of the Gas Blender. MCQ INSTRUMENTS is not responsible for any instrument damage caused by an inappropriate use of the instrument itself.

<b>Mass Flow Rates (for each channel)</b>	50-15000 sccm on N2 (standard) up to 30000 depending on the number of channels
<b>Total Output Mass Flow Rate</b>	up to 30000 depending on the number of channels
<b>Gases *</b>	N2, O2, CO2, CH4, Air, He, H2, etc.
<b>Inlet Gas Channel</b>	2 Input based on the model
<b>Outlet Gas Channel</b>	1 Output of mixed gases
<b>Channel's Fittings **</b>	NPT Swagelok or push-in fittings, for 6-4 mm tubes
<b>Input Channel</b>	USB PC Interface, RS485
<b>User Interface</b>	Touch display, Gas Mixing Software

\* Additional gases supported on request

\*\* Additional on request



## STATEMENTS



## CONTACTS

In case you need technical assistance do not hesitate to contact MCQ INSTRUMENTS:

- E-mail: [support@mcqinst.com](mailto:support@mcqinst.com)