







Instruction manual GMS_3CH Gas mixing system

Intended use	1
Technical Data	2
Installation.....	2
Driver installation for USB - RS485 converter - connection to PC.....	2
Software – Installation	2
Installation of GMS_3CH (hardware).....	2
1. Electrical connection	2
2. Gas connections	3
Startup operations.....	3
Maintenance	3
Calibration.....	4

Intended use

<p>Before operation this instruction manual has to be read. During installation, operation, maintenance and shut-off this instruction manual has to be observed.</p> <p>The GMS_3CH is designed for use of the following gases :</p> <ul style="list-style-type: none"> • Air • Nitrogen • Oxygen • other non-corrosive gases <p>All used gases must be free of particles</p>	
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<p>When the GMS_3CH is operated with toxic, ignitable, combustible or explosive substances all safety instruction for these substances have to be observed carefully.</p> <p>In case of an accident :</p> <ol style="list-style-type: none"> 1. turn OFF the power switch. 2. turn OFF all power switches of peripheral units. 3. close all main valves of connected gases. 4. unplug the power cable. 	   
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<p>When the GMS_3CH is operated with substances, not listed above, the materials compatibility has to be checked for all sample wetted components.</p>	
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Important notice :

For gases the standard volume relates to 0 °C and 1013.25 hPa.
 Abbreviations and symbols :

MFC = thermal massflow controller for gases



WARNING - important notice



information

Technical Data

Mains power :	88 ~ 264 V AC, 47 ~ 63 Hz
Current consumption :	max. 3.15 A, fused (5 x 20 mm, 3,15 A)
Ambient conditions :	15 ° C to 40°C, 0 to 95% rH
Gas inlet conditions :	particle-free gases, max. inlet pressure : 4.5 bar(g)
Dimensions :	250 x 250 x 128 mm
Weight :	2.5 kg

Installation

Driver installation for USB - RS485 converter - connection to PC

Before connection of GMS_3CH with the PC read the instructions manual DA-70157 from the directory / driver. Connect the USB cable and install the driver according to the WINDOWS operating system.



Fig.1: USB connection GMS_3CH - PC

After connection GMS_3CH to PC a new COM (serial) port will be installed. This COM - port number - shown in the WINDOWS device manager - has to be registered in the GMS_3CH software.

Software – Installation

The GMS_3CH software has to be installed by executing setup.exe from the /setup directory.



For operation MS EXCEL® should be installed on the computer.

Installation of GMS_3CH (hardware)

1. Electrical connection

Connect the mains plug to mains voltage : 88 ~ 264 V AC, 47 ~ 63 Hz.

The GMS_3CH is switched ON / OFF by the red mains switch.

2. Gas connections



For assembly of tube fittings the Swagelok instructions manual - page 5 to 7 - has to be observed (directory 'Instructions').



For installation of tubings the bulkhead union has to be secured according to Fig.3 with a suitable wrench.

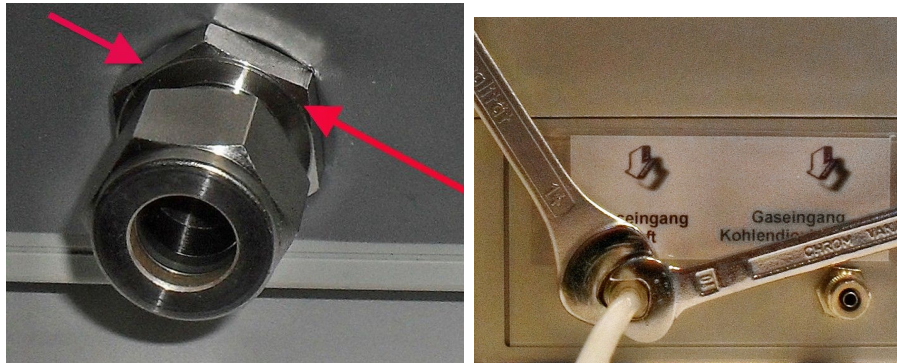


Fig. 2 and 3: fixing



Maximum inlet pressure : 6 bar.



Maximum outlet pressure : 3 bar.



When the operation is finished : close all valves at the gas containers !

Startup operations

1. Switch GMS_CH ON - red mains switch. A LED indicates correct power connection.
2. Connect the GMS_3CH to the PC : USB 2.0 or 3.0 port.
3. Start the GMS_3CH software.

Decommission

If the GMS_3CH is not operated for a long time the valves on the gas cylinders must be closed.

Maintenance

The enclosure can be cleaned with a mild detergent.



Avoid any moisture or particles inside the gas tubings - that can lead to serious damage of the MFCs.

Calibration

The (re)calibration can be performed by the user. A reliable reference device is necessary for every gas type.



The calibration data are stored in the MS EXCEL file GMS_3CH.xls. For each MFC and for each gas are stored 2 worksheets, one of them can be edited by the user, the according xxx_ggg(2) worksheet is protected against changing and should not be changed.

Only the yellow fields are editable – the others are locked. They contain the measurement data from each MFC and the corresponding reference data :

Flow_ref/Ncm³/Minute : gas flow of the reference instrument / reference method

Flow_GMS/Ncm³/Minute : gas flow from the GMS_3CH.

32 calibration points for each gas are necessary.



All data from the MFCs refer to 0°C and 1013,25 hPa, so the reference data must also refer to these conditions.

	A	B	C	D	E	F	G
1		GAS : air			Flow = slope_i x Flow_GMS + zero_i		
2		ascending values !					
3		Flow_ref/Ncm ³ /Minute	Flow_GMS/Ncm ³ /Minute	slope	zero		reference
4	1	0,000	0,000	1	0 1		Zirox
5	2	0,200	0,200	1	0 2		Zirox
6	3	0,400	0,400	1	0 3		Zirox
7	4	0,600	0,600	1	0 4		Zirox

Fig.4 : Calibration data GMS_3CH

When the GMS_3CH is started again the program will automatically read the new calibration data.

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