Instruction Manual

O_3 - Transferstandard

OZGU-370SE

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12.01.2024

HORIBA

CE

Declaration of Conformity

No. DC06717

WE THE MANUFACTURER

Name	HORIBA GmbH
Address	Kaplanstrasse 5, A-3430 Tulln, Austria

DECLARE THAT THE PRODUCT

Designation	Ambient O_3 Transferstandard
Model name	OZGU-370SE

CONFORMS TO DIRECTIVES AND STANDARDS

Directive(s)	the EMC Directive	2014/30/EU
	the Low Voltage Directive	2014/35/EU
	the RoHS Directive	2011/65/EU
Standard(s)	The EMC Directive	EN61326-1:2013
	- Emission	Class B
	- Immunity	Industrial electromagnetic environment
	The Low Voltage Directive	EN61010-1:2010
	The RoHS Directive	EN50581:2012
	- Product Category	9. Industiral monitoring and control instruments

17 July. 2017
Date of issue

Signature
Rudolf Mörkl
General Manager

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1. Introduction

The multipoint calibration unit OZGU-370SE is designed for checking of Ozone analyzers. It is installed in air pollution monitoring stations, in laboratories for quality assurance and also in the production of gas analyzers. One main application is for the ongoing quality control in field.

The calibration unit OZGU-370SE is designed for the dynamic and continual manufacture of zero and span gas to perform all ongoing quality control procedures according EN 14625. Transferstandard OZGU-370SE is based on well proven Analyzer APOA-370 with integrated span gas generation unit (ASGU-370 Electronic). This Span gas unit is able to provide ozone gas to an 2nd Ozone monitor. The actual concentration is measured by the type approved measurement cell of implemented analyzer part. The measured concentration is used as set point for the 2nd Ozone analyzer (measurement unit to be calibrated).

Due to the fact that OZGU-370SE is based on APOA-370 and ASGU-370, basic operation and maintenance instruction can be found in separate manual attached to this document.

2. Specification

Technical Advantages:

❒ Fulfils requirements of EN standards related to span-gas generation for laboratory test and for continuous quality control at field test

❒ ASGU-370 calibration electronic developed and manufactured in Austria

❒ Comfortable operation via 2 big illuminated Touch-Screen-Displays

❒ Operation via RS232 and Ethernet interface (Bayern Hessen protocol)

❒ Delivery scope includes remote software for easy external handling (LAN)

❒ High flexibility through free definable span points (up to 20)

❒ High flexibility through free definable cycles (e.g. Lack of fit)

❒ High flexibility through free definable sequences (stringing cycles together)

❒ Programmable timer allows time delayed start of calibration process

❒ Internal data logger (option) stores raw values from calibration procedure (set value and actual value, status) for reporting with included evaluation software

❒ Portable case available as option

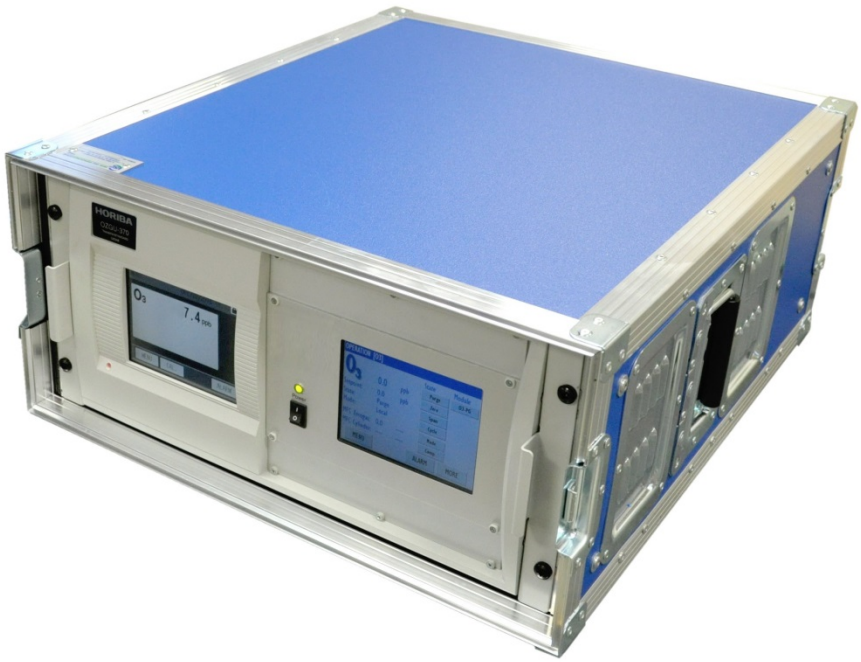

Figure 1: OZGU-370SE in portable case

Technical data in accordance to type approval test for APOA-370 no.: TÜV No. 936/21204643/A

Measurement Principle:

Ultra-violet-absorption method (NDUV)

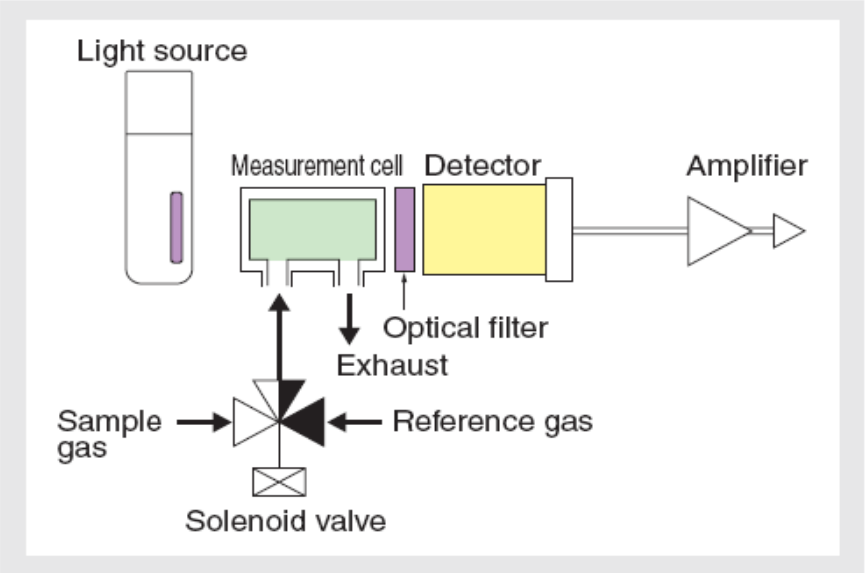

Figure 2: Measurement principal

Flow Schematic

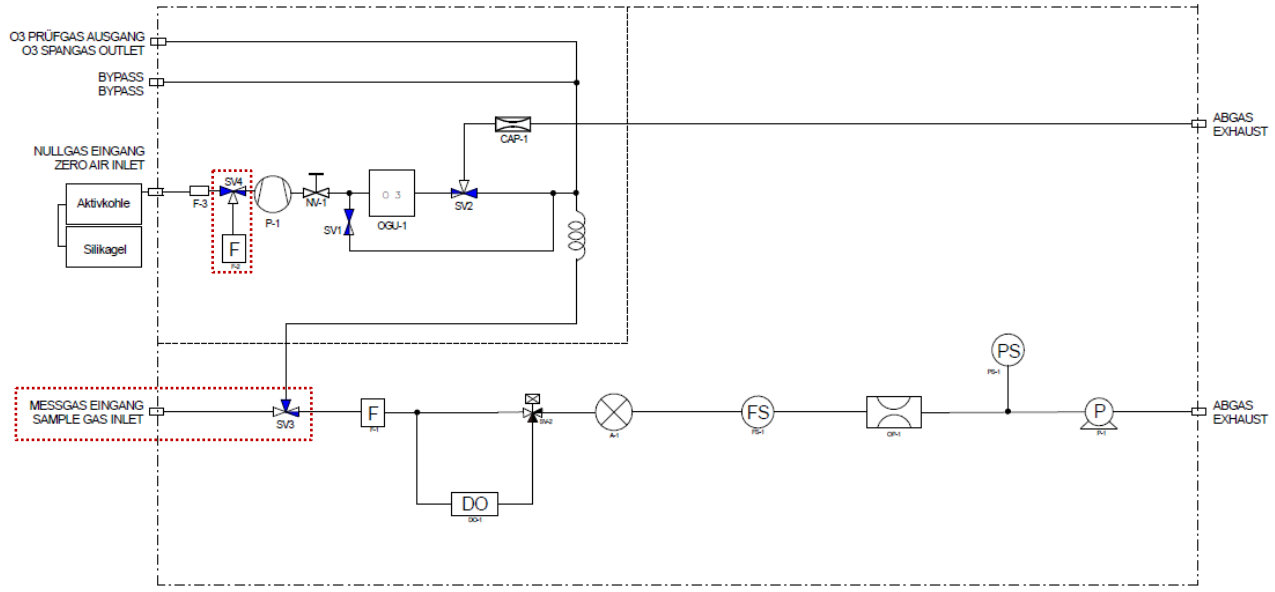

Figure 3: Flow Schematic

OPTION: Measuring device switchover, here the solenoid valve SV3 and SV4 are switched in the ASGU state “Purge” and the APOA works as an O3 measuring device. For the data transfer over Bayern/Hessen protocol during this measuring mode, there is also the SIO-370 in the APOA part built-in.
In the standard OZGU, the SIO-370 and the two solenoid valves are not present and in the ASGU “Purge” state, the pump is switched off using a semiconductor relay. Here the data transfer from the Bayern/Hessen protocol takes place directly using the ASGU interface COM2.

Operation

On the left side there is the display from the APOA-370 analyzer (Pos 1). Here you can see actual ozone concentration and additional information about the analyzer (see APOA-370 Operation Manual). Normally this screen is used only for the calibration of the OZGU-370SE by accredited laboratory. At standard operation of the OZGU-370SE the mode on this display should be set to MEAS (Measure).
Because of the internal use of the Ethernet interface to query the ASGU for setpoint values, the IP address 192.168.0.8 should not be changed by the APOA. Furthermore, when using the OMRON controller E5CC-CX3A5M-007 for O3 concentration control, the measuring range of Analog output 1 must remain set to 1000ppb.

On the right side there is the display from the ASGU-370 calibration unit (Pos 2). Indicated set point is the measured ozone concentration.

For additional information about operation of the calibration unit and touch screen display please have a look to SOFTWARE eASGU Operation Manual.

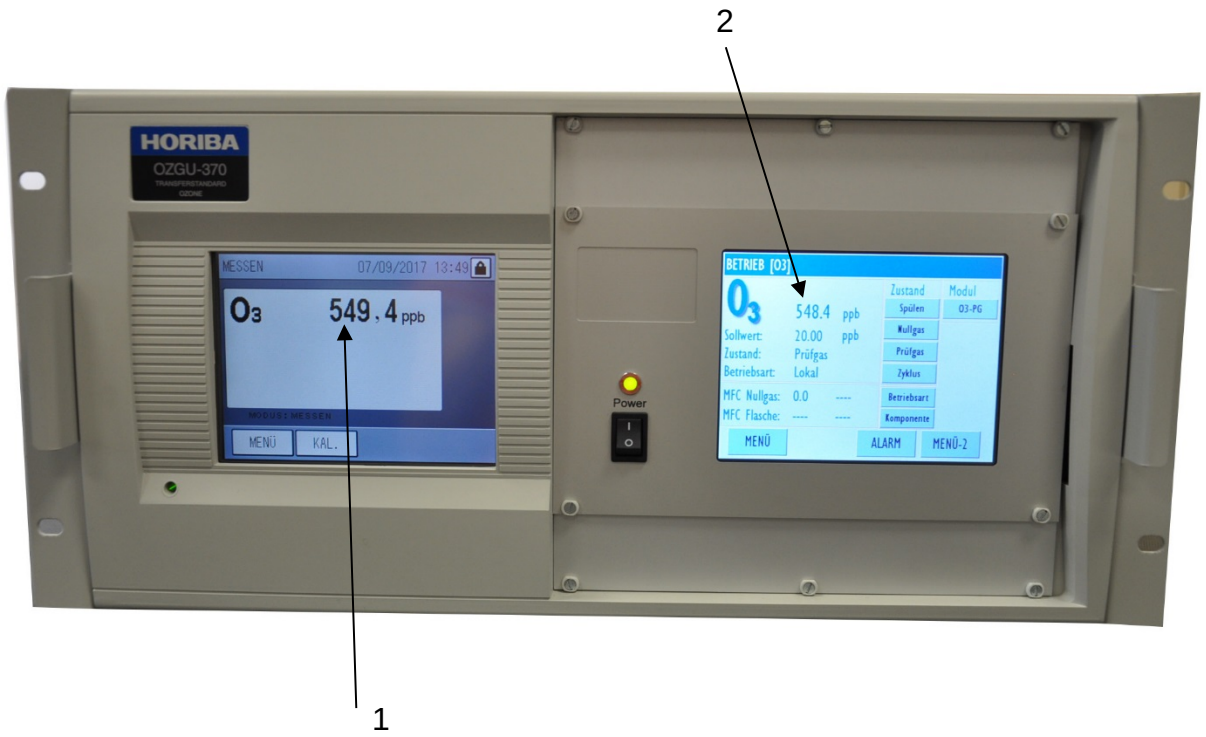

Figure 4: Front side of OZGU-370SE

Spangas points with OMRON Controller E5CC-CX3A5M-007 for OZONE control:

The OMRON Controller adjust the voltage from the UV Lamp for the Ozone production.
The Setpoint is the selected Spangas point in the Span menu from the ASGU.
The 20 Spangas points are fix from Horiba preconfigured and the Controller get depending on the selected Spangas point a Setpoint value between 0-10V.
For the actual measurement value is used the Analog Output 0-10V (1000ppb measurement Range) from the APOA.
With this modification the ozone concentration can adjust to the selected Span value.

The maximal reached Ozone concentration is selected with Spangas point 900.
The reached actual value and whether the point is stable dependents from the adjusted flowrate and the UV-lamp.

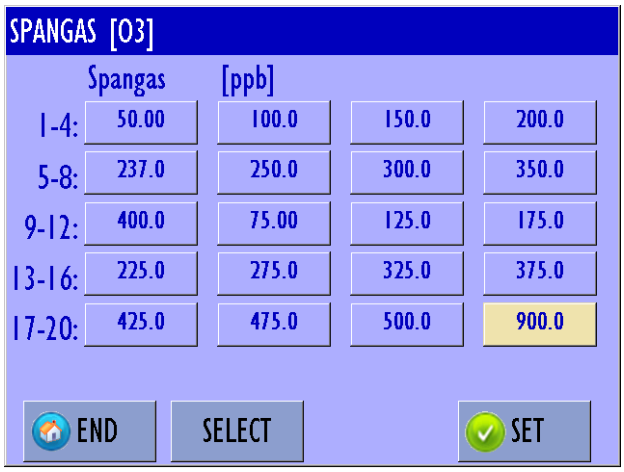

Figure 5: 20 Spangas points from Horiba preconfigured

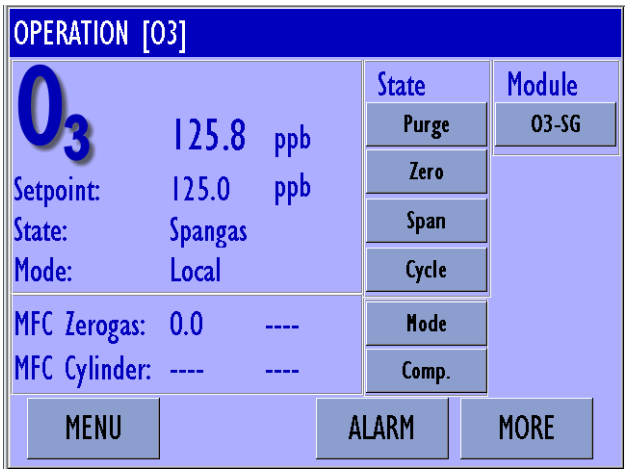

Figure 6: Actual value is controlled to selected Spangas point

CYCLE Param

Description below shows the standard adjustment of the eASGU software for cycles like linearity checks and other quality control activities.
The values with a (*) according EN14625.
You can find further information on the cycle parameterization in the manual SOFTWARE eASGU.
*The certification range for ozone is 500µg/m3 (250ppb)

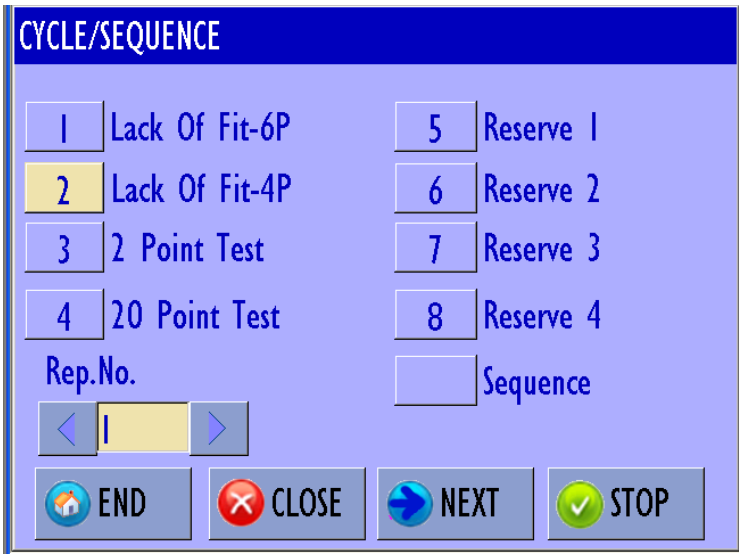

Figure 7: Cycle Param

- **Lack of fit-6P** (* first installation of analyser, after repair, modification)
  Cycle process / duration 132min:
  18min - 200ppb (80% of certification Range)
  18min - 100ppb (40% of certification Range)
  18min - 0ppb (Zero gas)
  18min - 150ppb (60% of certification Range)
  18min - 50ppb (20% of certification Range)
  18min - 250ppb (95% of certification Range)

- **Lack of fit-4P** (* once a year, after repair)
  Cycle process / duration 64min
  12min - 0ppb (Zero gas)
  12min - 50ppb (20% of certification Range)
  12min - 150ppb (60% of certification Range)
  12min - 250ppb (95% of certification Range)

- **2 Point Test** (*at least every 2 weeks, recommended every 23 or 25 hours)
  Cycle process / duration 80min
  40min - 0ppb (Zero gas)
  40min - 250ppb (95% of certification Range)

- **20 Point Test**
  Cycle process / duration 200min
  Every Point is active for 10 min to check the several concentrations values.

Equipment view – rear side:

On the rear side you find all necessary gas connections as well as the scrubbers for zero air generation. Instead of these scrubbers also external zero air can be used (pressure free).

Figure 8: Rear side of OZGU-370SE

1..... O_3 Span gas outlet	Span gas outlet for external O_3 - Monitor (Instrument to be tested/ calibrated)
2..... Purge Outlet	Purge of internal ozone generator
3..... Exhaust	Analyser Exhaust
4..... Bypass	Overflow of internal ozone generator
5…..Column	connection for silica gel and active carbon column
6..... Activated carbon	for zero air generation
7..... Silica gel	for zero air drying
8..... RS 232 Computer	25pin connector from eASGU to Computer Bayern/Hessen Protocol
9..... RS232 Analyzer	9pin connector from eASGU to Analyzer (only with Option Datalogger see page 13)
10... Ethernet	Ethernet connector APOA-370 Horiba / UDP Protocol, Port 53700 42i Thermo C-link / TCP Protocol, Port 9880 Remote Software / eASGU Protocol / TCP Further data retrieval / B/H Protocol / TCP, Port 40002

3. Configuration

The output span gas flow, as well as the O_3 concentrations can be adjusted. Furthermore in menu *Cycle* the program sequences can be modified according to your need.

Default settings eASGU:

The instrument is delivered with following default settings:

Table 1: Default setting ASGU

Params / Module O_3	**Param**	**Value**	**Description**
Source	Ozone at 1l/min	0ppb	Not used
Source	Factor mass-voll	0.5	calculation mass (µg/m^3) – voll (ppb)
Source	Remote Address	112	Component identification B/H protocol
FlowRate	Purge Zerogas:	0.0	Not used
FlowRate	Zero Zerogas:	1.0	Not used
FlowRate	Span Zerogas Minimum:	0.0	Not used
Span	Concentration-related Spangas points	0 – 1000ppb	pre-configured from Horiba
Cycle	Number 1 - 9	Cycle param 1 - 9	8x cycle and 1x sequence free configurable
Cycle	Lack of fit …..	Name of cycle	Name of cycle free configurable
Analyzer	Type, Serial No, Component, Unit Station, Cert.Range	Values from the tested analyzer	Parameters for the connected Test Analyzer
Analyzer	Protocol, Port, IP	Network values from the tested analyzer	For HORIBA / UDP Protocol (AP-370) , C-Link/TCP Protocol (Thermo 42i)
Analyzer	Baudrate, Databits, Stopbits, Parity	RS232 values from the tested analyzer	For Bayern/Hessen Protocol
Comp.	Sel. Comp	Ozone	
Params / DEVICE / Date/Time			
	dd.mm.yyyy / hh:mm	Actual date, time	
Params / DEVICE / Communication			
Ethernet	IP	192.168.0.29	IP from the ASGU part
	Gateway	192.168.0.204	Normal IP from the remote PC
	Mask	255.255.255.0.	Subnet mask
	DNS	0.0.0.0.	not used
	Port	40002 Port for B/H protocol	
RS232	Baud, Datab,Stopb, Parity, MD	9600,8,1,no,0	Baudrate Computer
Other	Multiplier	1	Multiplier for Datalogger received datas from the analyzer = 5sec * multiplier
Protocol			Not used

Params / DEVICE / Alarm limits			
Flow			Not used
Temperature	Temp.Lamp-O_3	0.5 °C	Alarm boarder + / - 0,5C° from 70°C
Other	Delay time	30sec	Delay when the alarm appears
Params / DEVICE / Password			
Password:	Enter Parametrization:		Password for Params menu
	Remote Software:	remote	Password for ASGU eRemote software
Network:	Username:	user	Username for Samba Server
	Password:	user	Password for Samba Server

The default configuration from the flow is 0,7l/min intern (OZGU) + 0,7l/min extern (O_3 monitor under Test) + 0,3l/min Overflow = 1,7l/min total flow rate

How to adjust ozone span gas flow:
The different voltages on the OGU board are fixed adjusted from Horiba Austria.
So it is only possible to change the flow. Higher flow rate effects lower concentration and vice versa.
Also some of the ozone monitoring instruments on the market are requiring a higher sample flow rate of more than 0,7 litre/ minute. So the actual flow has to be set accordant customer request between 1 and 3 litre/ minute in order to ensure enough overflow for save calibration. Thus there might be a situation, where the span gas flow needs to be adjusted and therefore the needle valve (Pos 1) can be used.

For measurement of the actual flow, connect a flow meter to "O_3 Span gas Outlet" on the rear panel. Furthermore you have to close "Bypass"- connector during your flow measurement. Now you are able to adjust the ozone span gas flow to the desired value.
Please note: Adjustment of O_3 span gas flow changes all span gas values accordingly!

1. NV1 for total flow = 0,7l/min intern + …l/min extern + …l/min Bypass

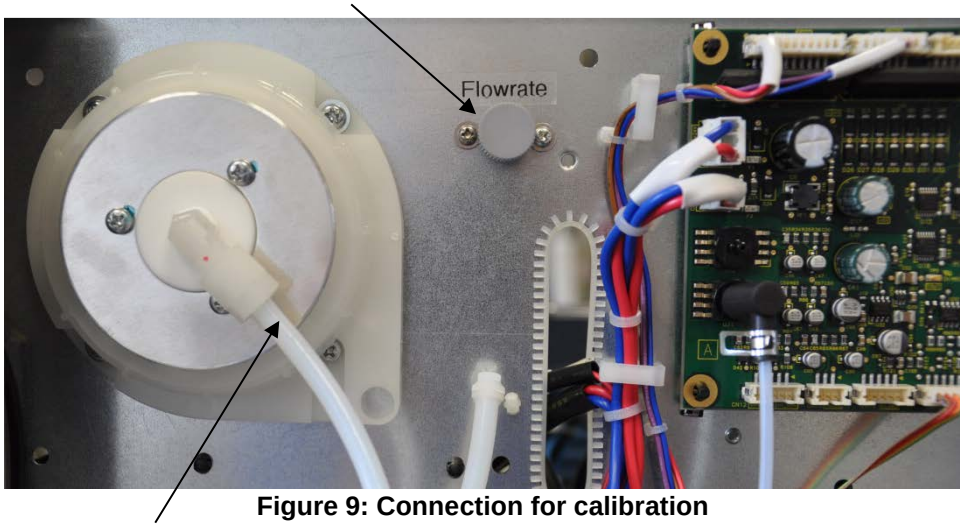

Figure 9: Connection for calibration

2. For calibration connect here the calibration gas or on the connector CAL when the calibration gas connector is lead to the rear side

4. Calibration of the Transferstandard

The Calibration of the O_3- Transferstandard has to be done at an international or national Institute/laboratory which is authorized to perform such calibrations. HORIBA recommends to do this once a year.
To calibrate with an external O_3 stanard you have to connect the calibration gas direct to the filter holder (see picture above). Select on the ASGU touch screen “Zero” or “Span” so that the pump is in operation. Afterwards calibrate the analyser part of OZGU-370SE. For more details see APOA-370 operation manual page 10.

5. Maintenance, Special spare parts

Spare parts and consumables are listed in the APOA-370 analyzer manual and should be replaced according to the interval specified in “Appendix to the manual AP-370”, which is an integral part of these technical papers.

For the Zerogas production are the Silica gel (1), the Active carbon (2), the DFU Filter (3) and the pump or diaphragm (4) to maintenance.
The condition of the Silica gel should be checked regularly and replaced if the colour indicator changes from orange to transparent. The Active carbon should be replaced at least once per year or when the zero point increase. The DFU Filter is to change when the surface is strong contaminated.
For the pump use the vacuum cleaned pump diaphragm 3200602390 for a correct and not increased zero gas.

For special applications it is also possible to use a bigger ozone oven (5) and a longer (stronger) lamp – this has to be defined, when ordering:

Standard UV Lamp for OZGU-370SE	Type CPQ-8153 L=80mm
Special UV Lamp for OZGU-370SE	Type CPQ-8153 L=117mm

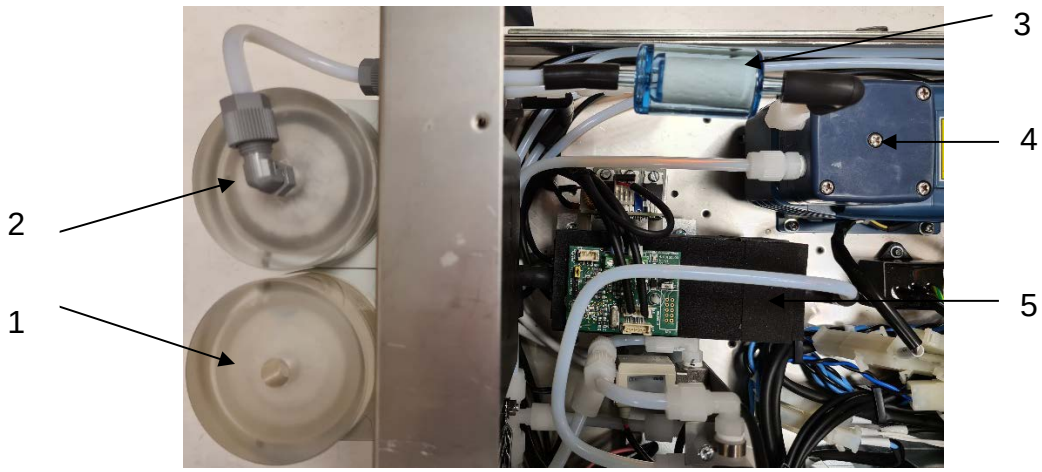

Figure 10: Maintenance parts OZGU

6. Data Logger and Excel Macros for Report

OZGU-370SE has as option the data logging from the test analyser.
Different Excel templates (.xlt) which use the Macro Kalib.xla enable a creation of final report.
This is possible for following firmware:

1.5.185 (Zero point always Zero)
1.5.186 and higher (Zero point is the value from the APOA-370)

For a description of this Data Logger function and the macros look in the Operation Manual Software eASGU.

Example: 6- point Linearity check with the Data Logger option:

1 Set point from the OZGU-Reference-Analyzer over internal TCPIP

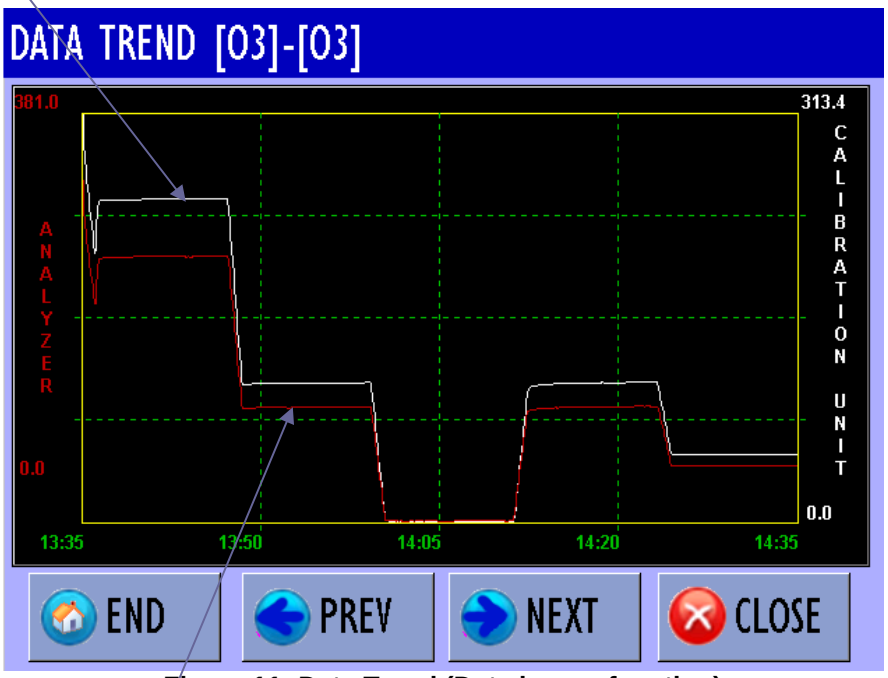

Figure 11: Data Trend (Data logger function)

2 Actual value from the Test Analyzer over external TCPIP or RS232