SION Technologies

ULTIMATE CARRIER SOLUTION UCS-1000

MANUAL

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NOTICE

No part of this guide may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Sion Technologies Ltd

SAFETY

A safety notice denotes a hazard. It calls attention to an operating procedure, if not correctly performed, it could result in damages to the product. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met

WARNING

A WARNING notice is a hazard. It calls attention to an operating procedure, if not correctly performed it could result in personal injury or damage. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met

WARRANTY

The material contained in this document is provided “as is" and is subject to being changed without notice, in future editions. Sion Technologies warrants the products it manufactures and distributes, except those specially exempted, to be free from defects for one full year from the date of shipment. This warranty is limited to the original purchaser of the product and is not transferable. This limited warranty does not extend to any products that have been damaged as a result of accident, misuse, abuse, service or modification by anyone. Except as expressly set forth above, no other warranties are expressed or implied including, but not limited to, any implied warranties merchantability and fitness for a particular purpose, and Sion Technologies disclaims all warranties not stated herein. In the event the product is not free from defect as warranted above, the purchaser’s sole remedy shall be provided above. Under no circumstances will Sion Technologies be liable to the purchaser or any user for any damages, including the incidental or consequential damages, expenses, lost profits, lost savings or other damages arising out of the use or inability to use the product. This warranty shall not be applicable to the extent that any provision of this warranty is prohibited by any federal, state, or municipal law that cannot be preempted.

SAFETY INFORMATION

Warnings in the manual or on the UCS-1000 are to be observed during installation, operation, service and/or repair of the instrument. Sion Technologies will assume no responsibility for customers failing to comply with the safety precautions stated. Use of the UCS-1000 for something other than the intended use of the instrument is prohibited. The use of the UCS-1000 is for trained personnel only. Personnel operating the UCS-1000 should wear safety glasses, safety shoes and gloves where appropriate. The UCS-1000 is not intended for use in a hazardous environment. Installation of the UCS-1000 requires that there is nothing blocking the vents of the system. Installation of the UCS-1000 requires that the instrument be placed on a non-flammable surface capable of handling the weight of the instrument.

Safety Symbols

See accompanying instructions for more information

Indicates hot surface

Indicates an electrical hazard

Indicates a risk of hand entanglement

Indicates a sharp point

Indicates bulky / heavy item, use two persons to lift

Indicates risk of explosion

Electrical Hazards

The power cord supplied with the UCS-1000 system must be connected to a power outlet with a protective ground contact. If using an extension cord or a Power strip, make sure that it also has a protective ground contact

Do not change the internal or external ground connections. Tampering with the grounding connections will result in a voided warranty and could damage the UCS-1000

If electrical damage to the UCS-1000 is suspected, contact Sion Technologies in order to have a service representative evaluate the system. DO NOT try to address the problem until a service representative has looked at the UCS-1000

Disconnect power cords from the UCS-1000 before performing instrument maintenance or service

Do not disconnect any of the electrical assemblies while the power is on. Turn the power off and unplug the power cord before disconnecting any electrical assembly

Additional Hazards

Never try to repair any components of the UCS-1000 without the assistance of your local distributor or Sion Technologies' technical support which can be reached via email sion@sion-tech.com
If the UCS-1000 is damaged during unauthorized repairs, the warranty will be voided

The power switch for the UCS-1000 is on the back of the instrument with the Symbol "1" meaning ON and "0" meaning OFF. The power supply of the UCS-1000 should be located where it is possible to unplug the AC power cord from the power supply/wall outlet in case of an emergency

Use safe laboratory practices when operating the UCS-1000

If a printed circuit boards fails, contact Sion Technologies technical support for a replacement board. Technical support email: sion@sion-tech.com

To avoid injury during operation of the UCS-1000, keep hands away from heated surfaces labeled "Hot Surface do not touch"

General Specifications

Power Requirements

100/120V 60Hz –6A Fuse
220/240V 50Hz - 3A Fuse

Indoor Use

Up to 2000m altitude
10°C to 35°C room operating temperature.

Burner Normal Operation Temperature

200ºC – 1,500ºC (392ºF – 2,732ºF)

Dimensions/Weight

200mm (W) X 215mm (D) X 385mm (H)/ 6Kg
7.87"(W) X 8.46"(D) X 15.15"(H)/ 13.22lbs

Touch Control Panel Size

4.3" (131mm X 78mm)

Main Carrier

H_2 (Hydrogen)

Alternate Carrier

H_e/N_2 (Helium / Nitrogen)

Handled Split Flow

H_2 0-300ml/min
H_e 0-250ml/min
N_2 0-200ml/min

H_2 Supply – GC Grade

50-90 PSI (45/90 ml/min - carrier dependable)

Air Supply – GC Grade

50-90 PSI (500~600 ml/min)

Number of Injectors Handled

One GC - Up to 2 Injectors

Input Ports

4 Inputs (H_2, Air, Split & Septum Purge, Alternate Carrier in)

Output Ports

1 Port (Carrier to GC)

UCS-1000 PRODUCT OVERVIEW

The “UCS-1000 Ultimate Carrier Solution” is the ultimate solution to use Hydrogen as your preferred carrier gas in your GC / GCMS.

Using the UCS-1000 will save you 95% of your H_e costs. The resulting “fast chromatogram” will gain you a higher throughput in your lab.

The UCS-1000 gives the operator the ability to easily select an alternate carrier gas. For most applications the operator can work with Hydrogen as a carrier gas. By a simple press on the touch screen of the UCS-1000, one can easily switch to an alternate carrier gas such as H_e or N_2.

Above all, working with UCS-1000 guaranties clean air for your lab protecting operators’ health when using Hydrogen, H_e or N_2 as carrier gas, completely eliminating the release of hazardous chemicals to the air.

The UCS-1000 solves the major safety problem when using Hydrogen as carrier gas in GC/MS by preventing the buildup of Hydrogen in the MS after a power failure.

UCS-1000 INSTALLATION

General Information

The system setup and installation are intended to be as complete as possible.
If in doubt at any point during the installation, please contact Sion Technologies at: sion@sion-tech.com.

If the installation is not directed or performed by Sion Technologies personnel or an appointed representative, the operator must be thoroughly familiar with the setup and installation instructions enclosed with the UCS-1000.

NOTE
Failure to follow the installation instructions as set forth could result in damage to the product and nullify the warranty.

Installation Instructions

Refer to Figure 1

1. Connect the Hydrogen supply using a line regulator to input #1 at the rear of the UCS-1000
2. Connect the air supply using a line regulator to input #2 at the rear of the UCS-1000
3. Connect the alternative carrier supply (N_2 or H_e) to input #3 at the rear of the UCS-1000
4. Connect the split line and septum purge from the GC to input #4 at the rear of the UCS-1000
5. Connect the GC carrier input to outlet #5 at the rear of the UCS-1000
6. Connect a communication cable between the lower and the upper units: input #9 to input #10
7. Connect the power cable 220V – 230V AC / 100-110V AC (see the label on the back of the UCS-1000) to input #7 at the rear of the UCS-1000
8. Open the supply gases (Hydrogen, Air, N_2/H_e) and make sure that there are no leaks from any connection

BACK INSTRUMENT OVERVIEW

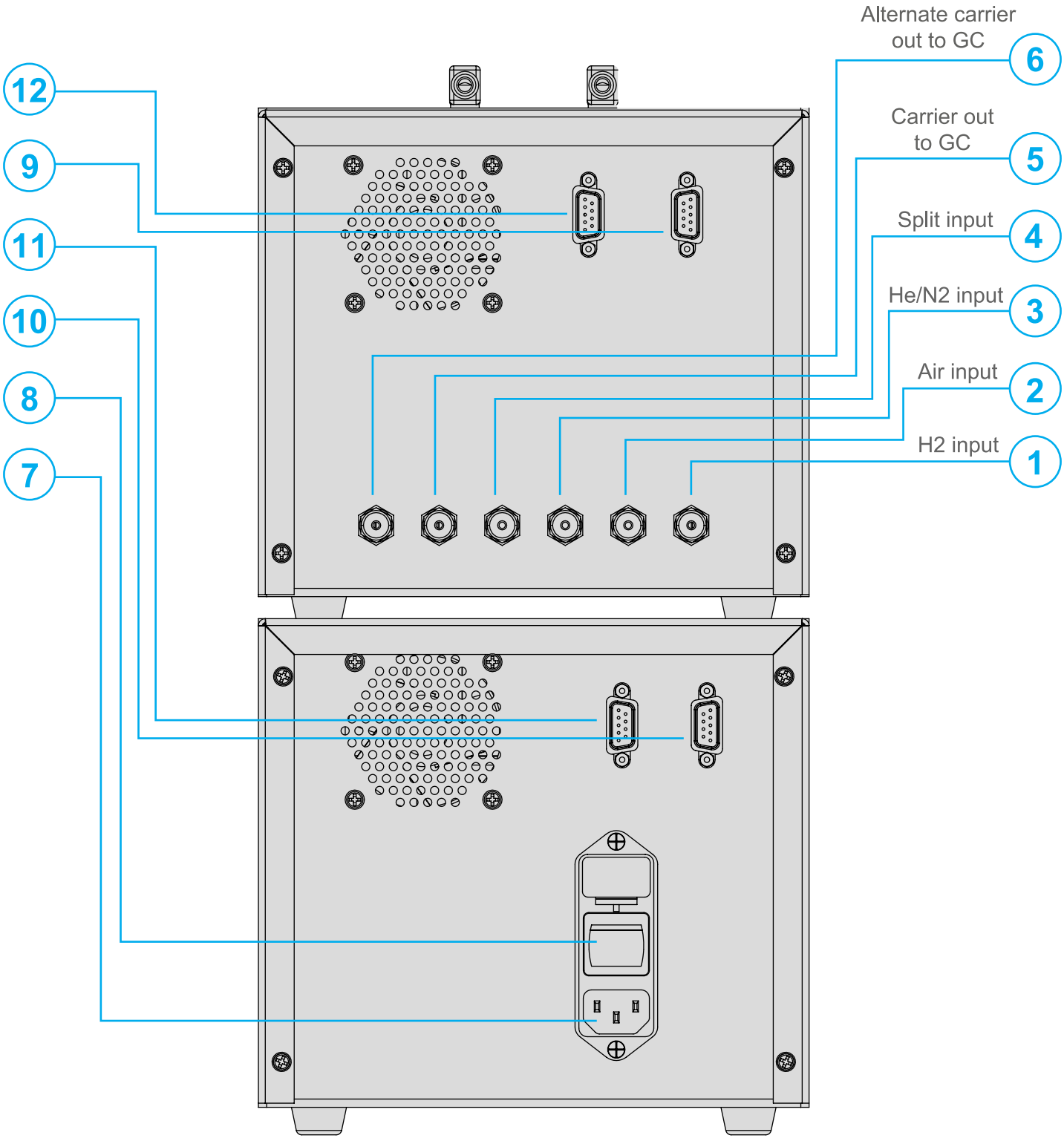


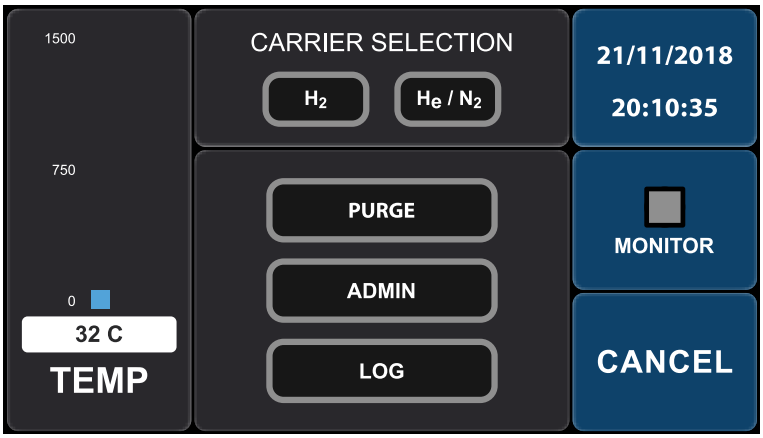
Figure 1

BASIC OPERATION

1. Switch on the UCS-1000 (Figure 1, #8) and wait for the operation screen – see example of the startup screen below (Figure 2)
2. The UCS-1000 serial number and software version are shown on the startup screen

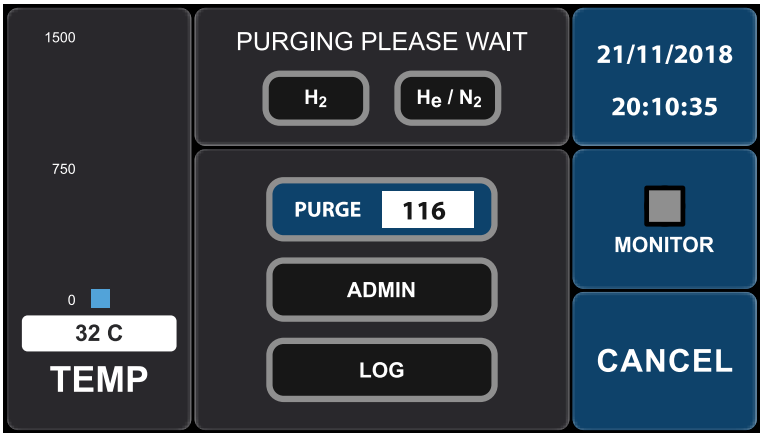
Startup Screen – Figure 2

3. Wait for the Carrier Selection Screen to appear (Figure 3). Alternatively, press the ⚙ located on the bottom right corner of any screen to show the Carrier Selection Screen (Figure 5)



Carrier Selection Screen – Figure 3

4. For a first-time operation or after Hydrogen supply problem press “PURGE” on the screen and wait for auto-release ~ 2 minutes (Figure 4)



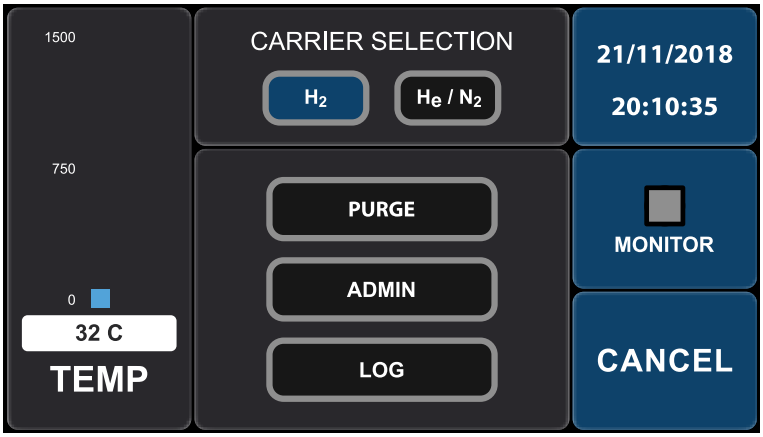
Purge in action – Figure 4

5. If needed, repeat this step until the Hydrogen line is purged completely
6. To cancel the operation simply press the “CANCEL” button on the screen
7. Choose your desired carrier gas by pushing the relevant button: “H_2” for Hydrogen carrier or “H_e/N_2” for alternative carrier
8. In order to return to the Carrier Selection Screen press the ⚙ on the bottom right corner

Switching to the Carrier Selection Screen – Figure 5

STARTING THE UCS-1000 IN H_2 MODE

1. In the Carrier Selection Screen press H_2 (Figure 6)



Switching to H_2 carrier– Figure 6

2. To start the system press, “START” (Figure 7)
3. The UCS-1000 will automatically begin its ignition routine. Wait until “MONITOR” changes to red and "SYSTEM RUNNING" message appears on the screen (Figure 8)
4. If within 1 minute “MONITOR” will not change to red “STOP” button will activate in red and alarm will sound. Push the “STOP” button to stop the alarm
5. In the above situation go back to the Carrier Selection Screen using the ⚙ on the bottom right corner, and press “PURGE” to purge the system once again
6. After “PURGE” is released select H_2 again and repeat steps 1 to 3 until “MONITOR” changes to red successfully
7. When “MONITOR” changes to red, switch your GC on, configure GC carrier as H_2 and work normally

Start pressed – Figure 7

System Running in H_2 Mode – Figure 8

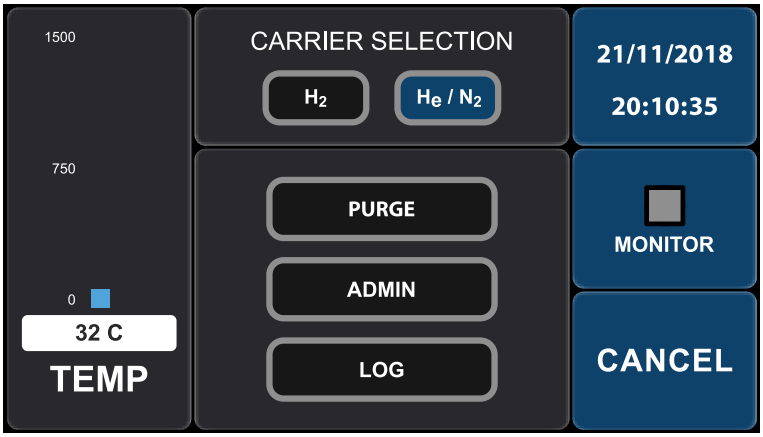
- When “MONITOR” changes to red switch GC to on and configure Carrier Gas as H_2 and work normally

In case of emergency press “STOP”

Emergency Stop in action – Figure 9

STARTING UCS-1000 IN H_e/N_2 MODE

1. In the Carrier Selection Screen press H_e/N_2 (Figure 10)
2. The system will switch to H_2/N_2 mode (Figure 11)



Carrier Selection Screen – Figure 10

H_e/N_2 Operating Mode – Figure 11

3. To start the system press “START” on H_e/N_2 Mode operating screen (Figure 12)
4. The UCS-1000 will automatically begin its ignition routine. Wait until “MONITOR” changes to red and "SYSTEM RUNNING" message appears on the screen (Figure 13)
5. If within 1 minute “MONITOR” will not change to red “STOP” button will activate in red and alarm will sound. Push the “STOP” button to stop the alarm
6. In the above situation go back to the Carrier Selection Screen using the ⚙ on the bottom right corner, and press “PURGE” to purge the system once again
7. After “PURGE” is released select “H_e/N_2” again and repeat steps 1 to 3 until “MONITOR” changes to red successfully
8. When “MONITOR” changes to red, switch your GC on, configure GC carrier as H_e or N_2 and work normally (Figure 13)

H_e/N_2 Start - Figure 12

System running in H_e / N_2 mode - Figure 13

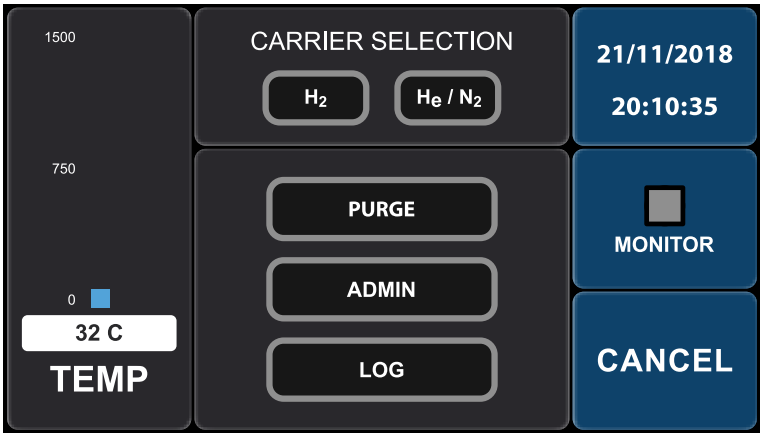
When "MONITOR" becomes red switch GC to on and configure Carrier Gas as H_e or N_2 and work normally

In case of emergency press “STOP”

Emergency stop in action – Figure 14

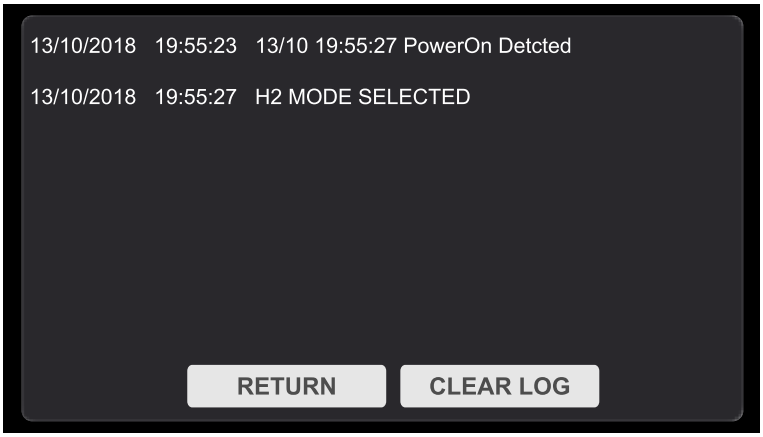
UCS-1000 LOG

1. Press the ⚙ on the bottom right corner in order to enter the Carrier Selection Screen
2. Enter the Log Screen by pressing the “LOG” button (Figure 15)



Entering Log Screen - Figure 15

The Log Screen as shown on Figure 16 records all events on the UCS-1000 such as alarms, operating modes, power failure, etc

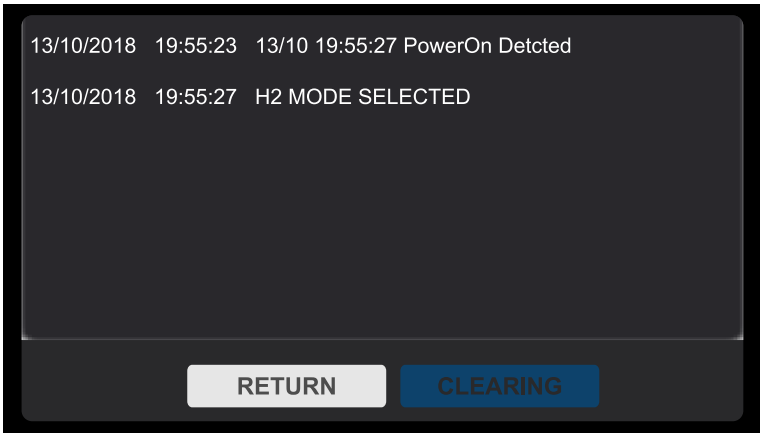


Log Screen - Figure 16

3. Log Screen will be shown for 2 minutes or until “RETURN” button is pressed
4. In order to clear the log press “CLEAR LOG” button and enter administrator password (Figure 17)

Clear Log password screen - Figure 17

5. If password is entered successfully “CLEARING” will be shown and after few seconds the log file will be cleared – Figure 18



Clearing Log - Figure 18

6. In order to return to Carrier Selection Screen press “RETURN” or wait 2 minutes

ADMINISTRATOR SCREEN

1. To enter Administrator Screen, press “ADMIN” on the Carrier Selection Screen (Figure 19)

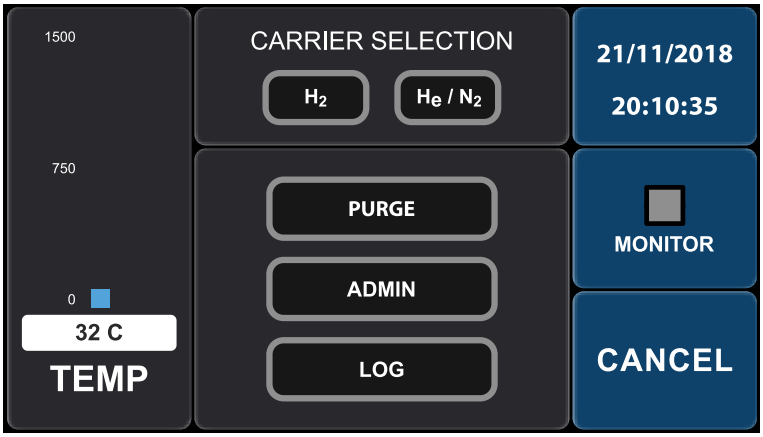
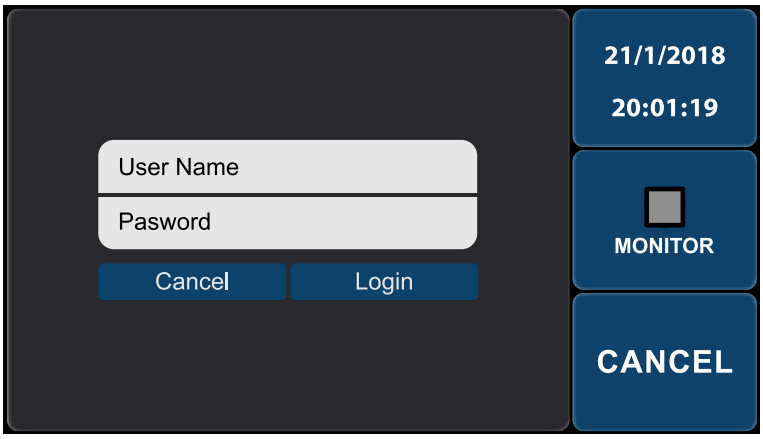


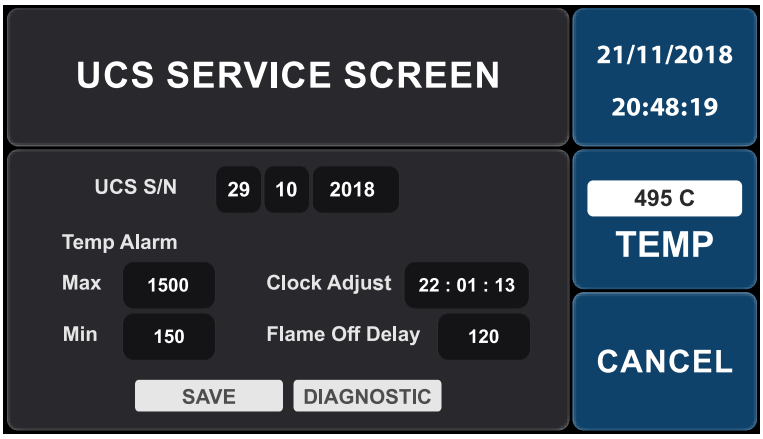
Figure 19

2. Enter User Name and Password and press “LOGIN” on the screen (Figure 20)



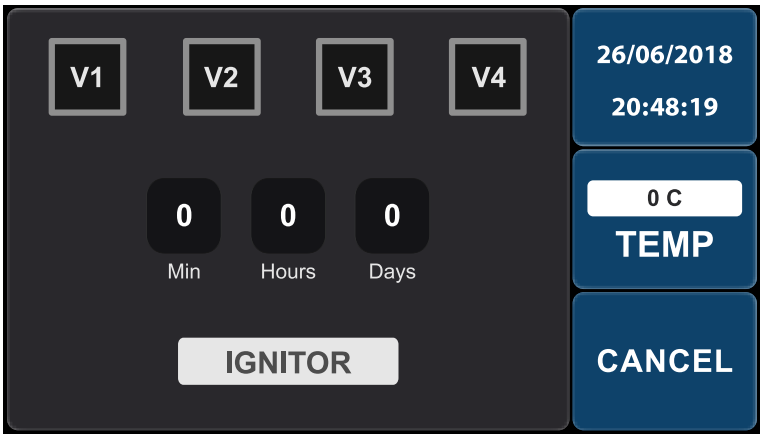
Enter User Name and Password – Figure 20

3. If User Name & Password are correct the Service Screen will appear (Figure 21)



Service Screen - Figure 21

- To return without changing parameters press “CANCEL”
- To save parameters press “SAVE”
- To change the UCS-1000 clock press on the Hours or Minutes indications on the Clock Adjustment line and enter the correct time
- To change minimum flame temperature alarm, press its set point and enter the desired set point between 120°C -200°C
- To change maximum temperature alarm, press its set point and enter the desired set point between 800°C - 1500°C
- To change flame off detection delay, press its set point and enter the desired set point between 120-300 half seconds
- To move into Diagnostic Screen press “DIAGNOSTIC” button (Figure 22)



Change parameter keyboard with limits - Figure 22

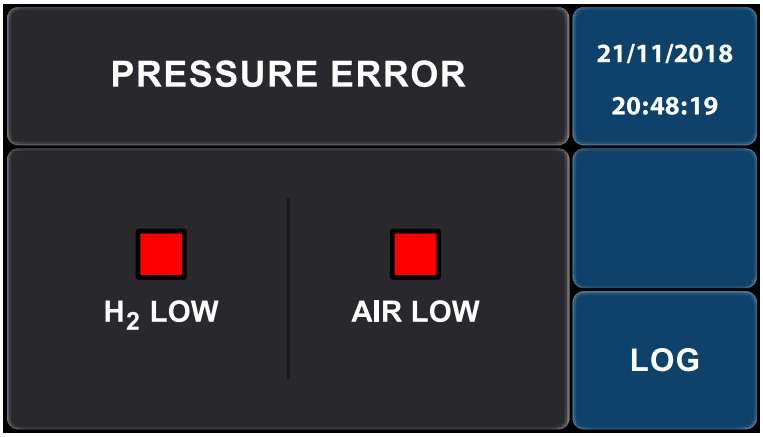
The Diagnostic Screen enables you to operate all the actuators and the ignitor manually

Be Careful when operating V3 and V4 since V3 and V4 control different Carrier Gases to the GC

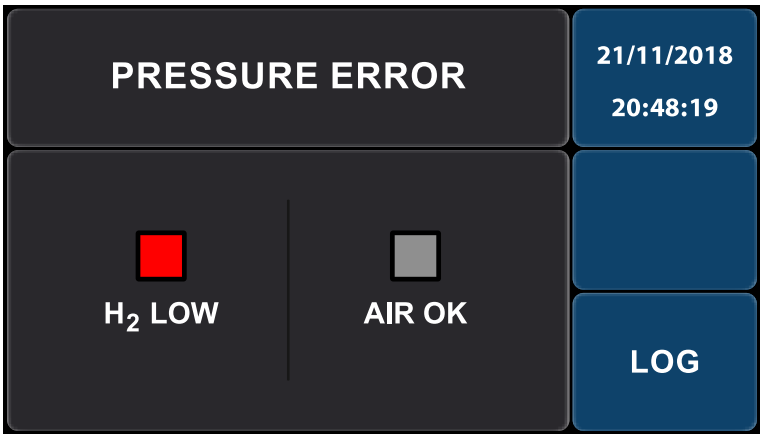
- Total working time indicator is shown on this screen as well
- To exit Diagnostic Screen press “CANCEL”

PRESSURE ERROR SCREEN

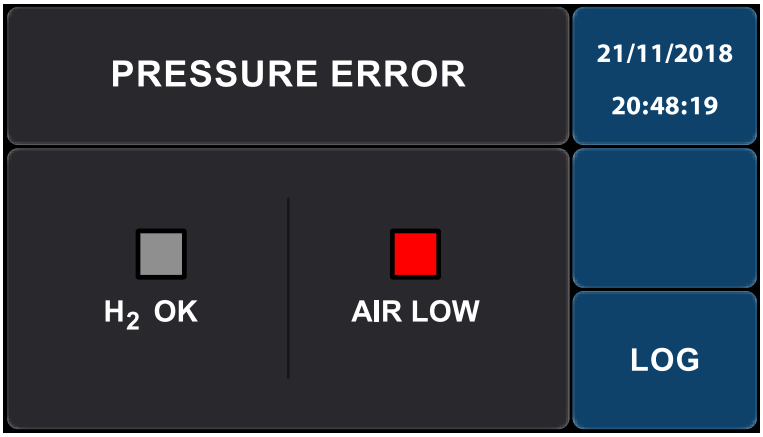
1. When air and/or the supply gas (H_2) pressure is low, Pressure Error Screen will appear, and the relevant indication will be red
2. Check and correct the relevant supply gas pressure (see Figures 23-25)



Low air & low Hydrogen pressure alarm - Figure 23

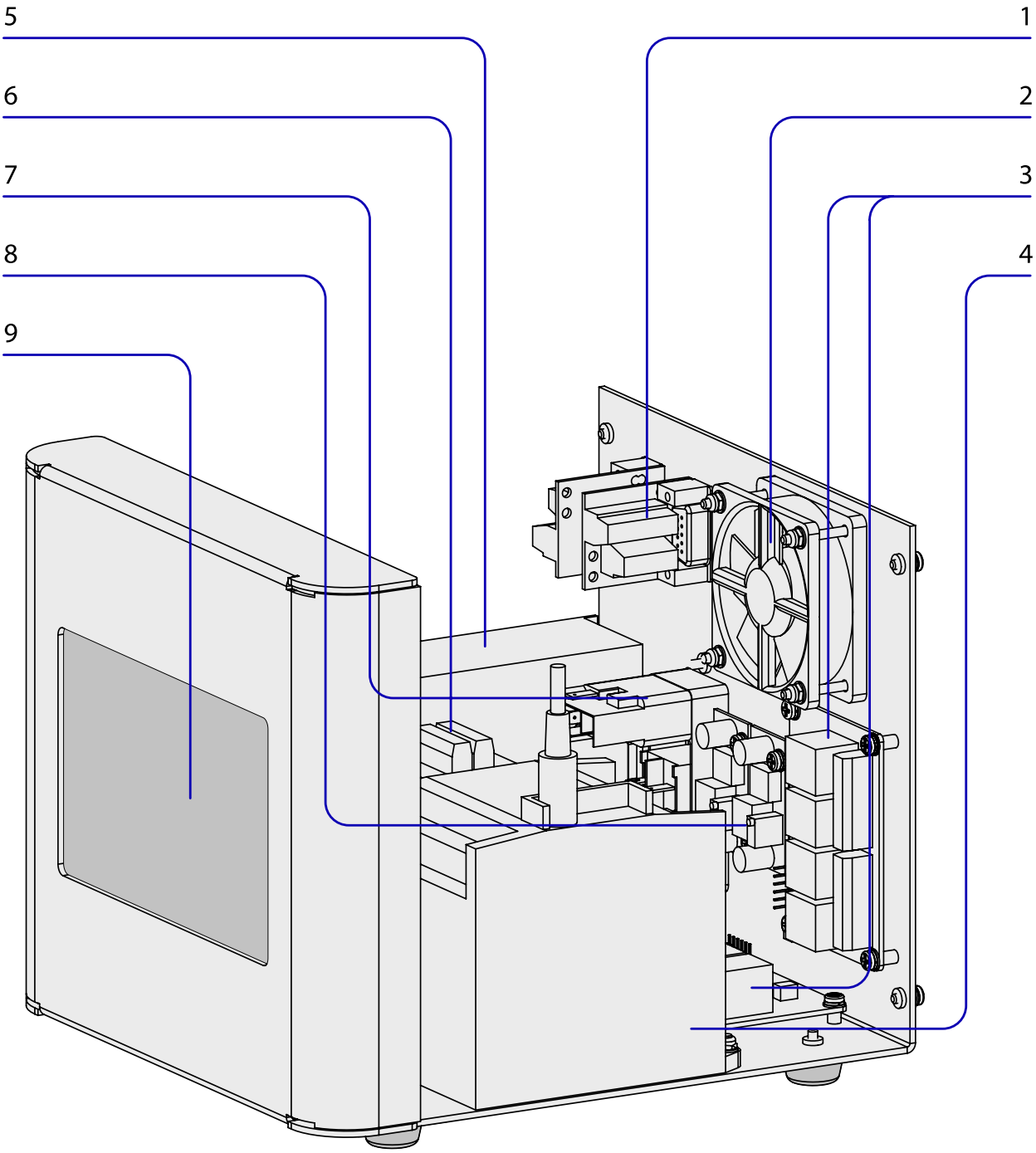


Low Hydrogen pressure alarm - Figure 24



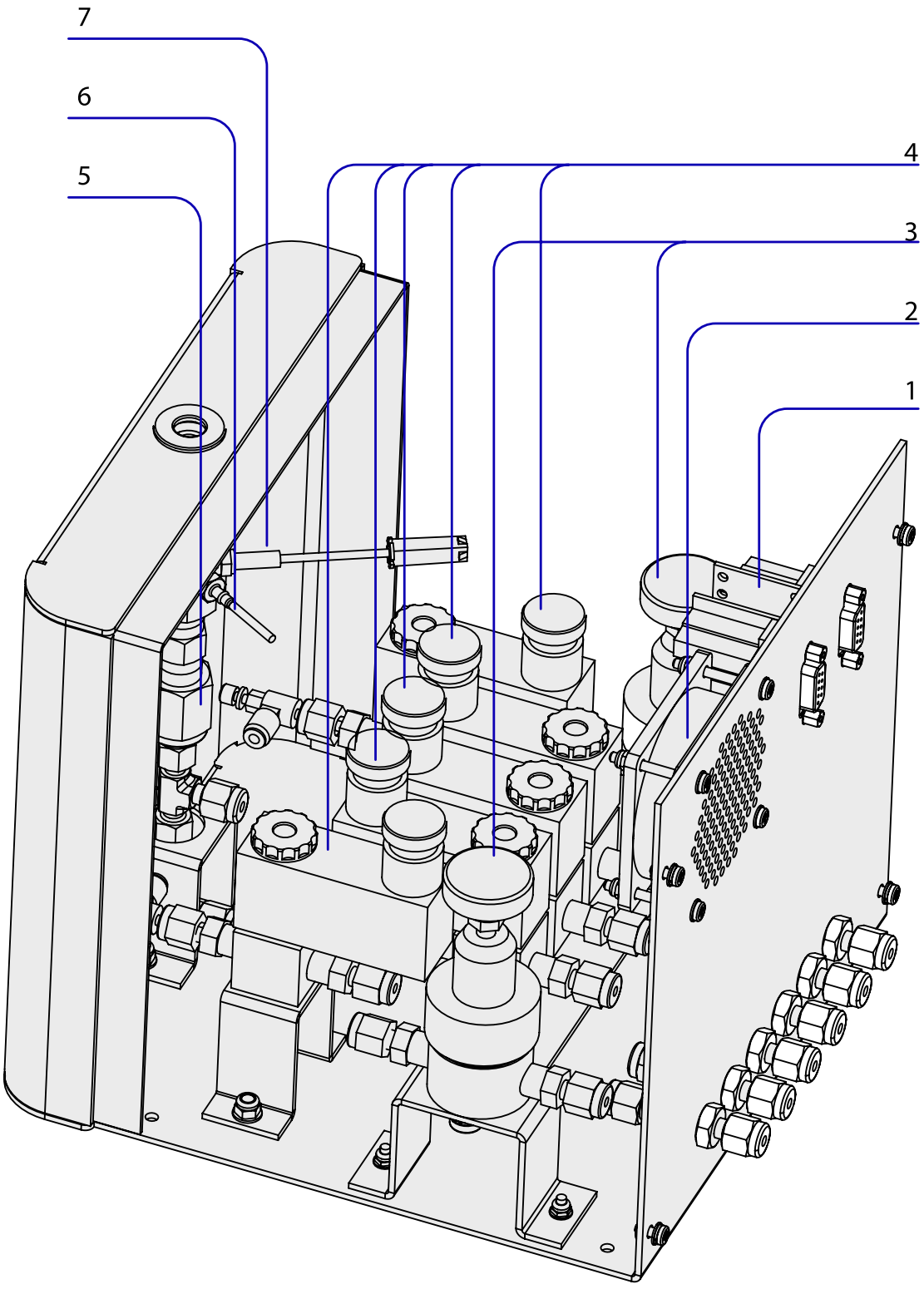
Low air pressure alarm - Figure 25

CONTROLLER LAYOUT



1. RS232 Connectors
2. Fan
3. Relay Modules
4. PLC (Programmable Logic Controller)
5. Power Supply
6. TC Interface
7. 220-240 V Socket Connection
8. Voltage regulator
9. Touch screen

BURNER LAYOUT



1. RS232 Connectors
2. Fan
3. Regulators
4. Solenoid Valve
5. Burner
6. TC
7. Ignitor

UCS-1000 WARRANTY

The warranty period of the UCS is one year, and lifelong maintenance will be needed. Maintenance and replacement parts within the warranty period will be free of charge. Beyond the warranty period, service and raw materials will be charged.

NOTE
If the following occurs, the maintenance will not be free of charge:
a. Users do not operate the UCS-1000 according to this operation manual;
b. Users disassemble parts by themselves, which is forbidden by the manufacturer.

Packing List

UCS-1000	1 pc
Power cord	1 pc
Operation manual	1 pc