

Smoke inhalation unit 24

User guide

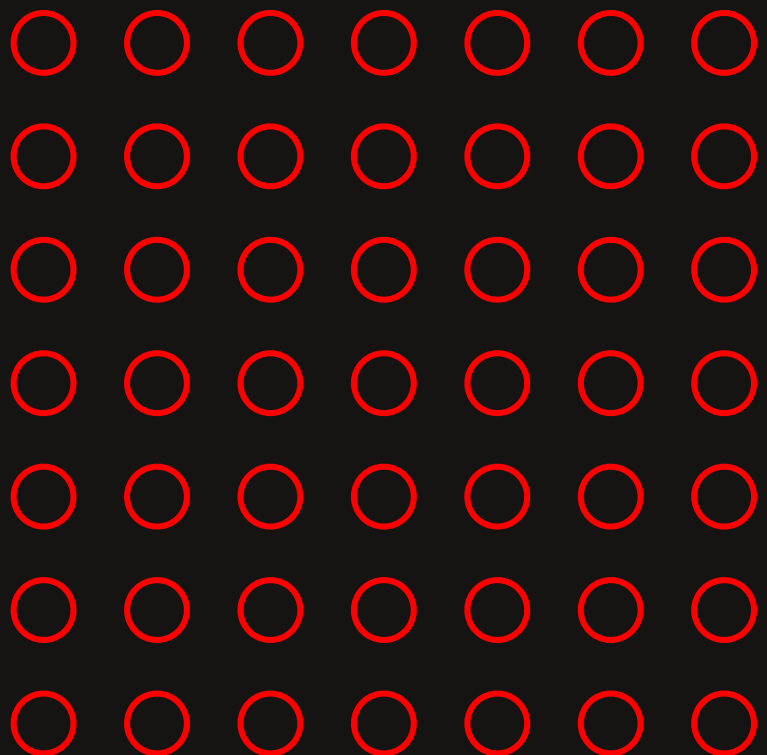


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1. System overview

The table below presents the main components of the SIU24 system.

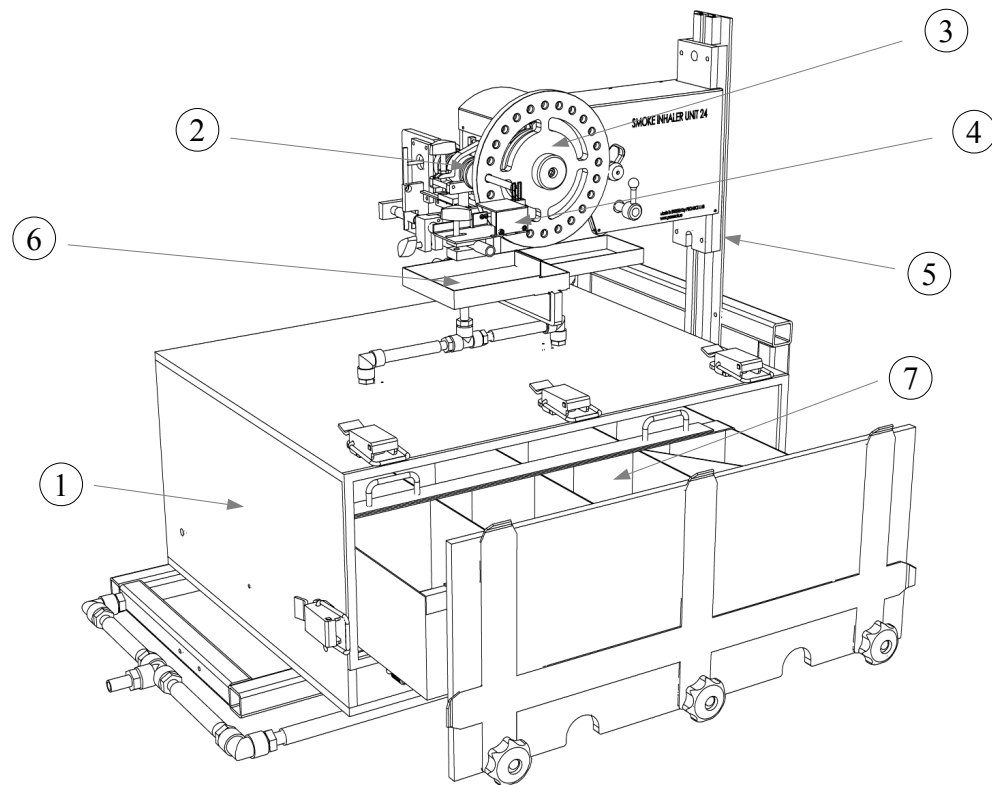
Hardware	Description
SIU24	Smoke Inhalation Unit 24 The mechanical part of the system.
SIU24 VCU	Smoke Monitoring Unit 24 Virtual Control Unit The electronic components needed to control the SIU24.
SMU 101	Smoke Monitoring Unit 101 A laser-based smoke monitoring device

Software	Description
SIU24 VCU with DSMU	Smoke Inhalation Unit 24 Virtual Control Unit with Dual Smoke Monitoring Units - The basic software needed to control the SIU24 hardware and two SMU 101.

2. Hardware

This section presents an overview of the Smoke Inhalation Unit 24, SIU24 Virtual Control Unit hardware and the Smoke Monitoring Unit 101.

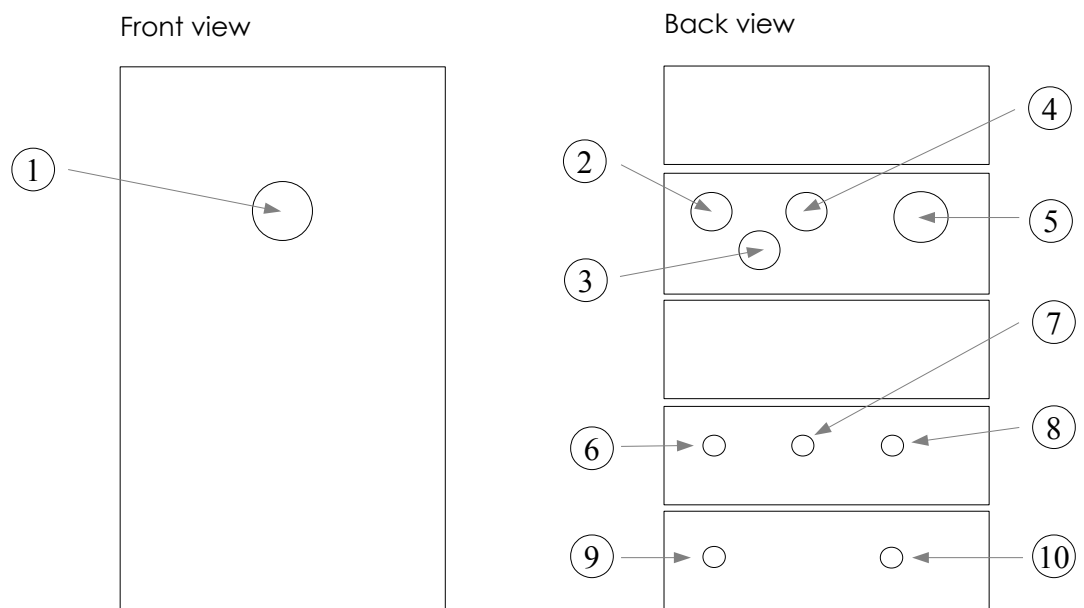
2.1 Smoke inhalation unit 24



- | | |
|------------------------------|------------------------------|
| 1. Smoke chamber | 5. Frame stand |
| 2. Mouthpiece | 6. Ash tray |
| 3. Cigarette wheel (max. 24) | 7. Animal box (max. 64 mice) |
| 4. Lighter | |

2.2 SIU24 Virtual control unit

A schematic picture of the SIU24 Virtual control unit is presented below.

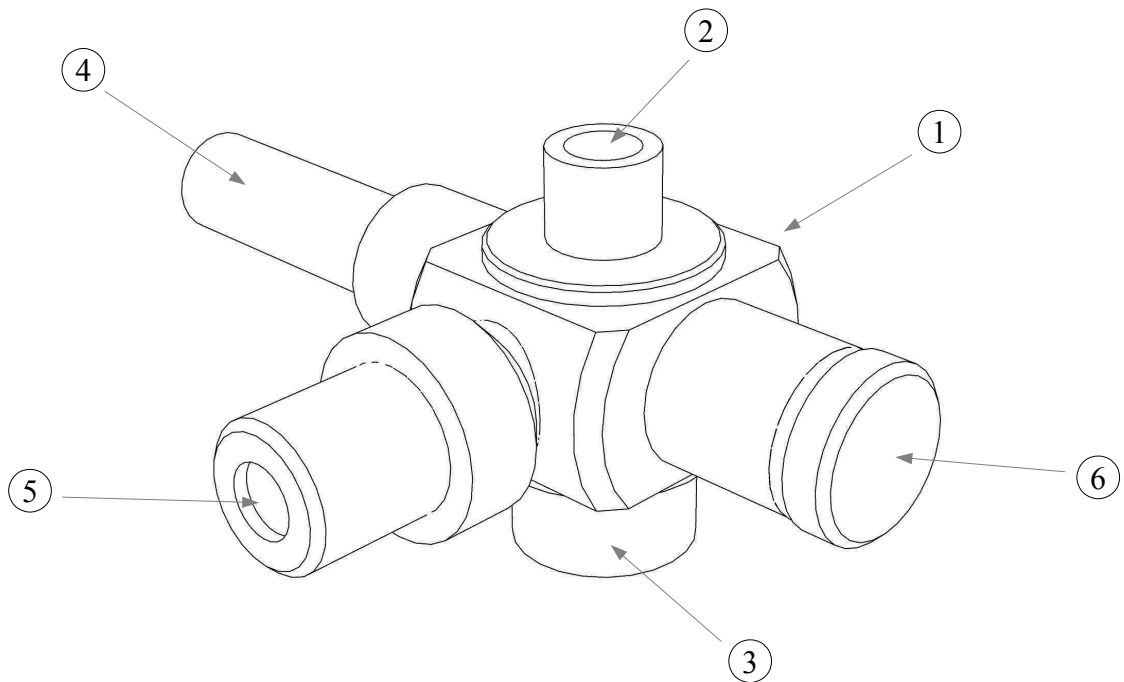


- | | |
|-------------------------|--------------------------|
| 1. Power LED | 6. 24 V/DC power |
| 2. Three pol. connector | 7. Laser 1 power |
| 3. Six pol. connector | 8. Laser 2 power |
| 4. Four pol. connector | 9. SMU box output signal |
| 5. USB socket | 10. SMU box input signal |

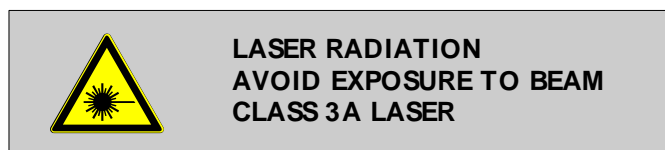
2.3 Smoke monitoring unit model 101

The contamination-free Smoke Monitoring Unit model 101 is an open flow solution without optical windows optimized for harsh environments. The vacuum driven unit delivers a 0-10V output signal.


The qualitative smoke signal is associated with the amount of smoke in the flow and enables comparing of different studies. The SMU 101 is part of the SIU24 system.



- | | |
|------------------|--------------|
| 1. House | 4. Laser |
| 2. Smoke inflow | 5. Detector |
| 3. Smoke outflow | 6. Beam trap |



3. Software installation

 *Do not plug in the USB cable before the software installation is completed!*

1. Insert the SIU24 Virtual Control Unit installation DVD-ROM into the computer DVD drive.
2. Run setup.exe.
3. Choose an installation folder for the application and its sub-components.
4. Wait for the installation wizard to complete.

3.1 Font installation

The SIU24 VCU software uses specific interface fonts but installing these fonts is optional. The fonts can be found in the installation folder. Follow the standard operating system procedures in order to install these fonts.

3.2 Getting started

1. After the software installation is completed, insert the USB cable and wait for the operating system to recognize the USB device. Verify that the device is working properly.
2. Double-click the SIU icon to start the SIU24 VCU application.

 *You may need to run the SIU24 VCU application as the system administrator!*

4. Software

The SIU24 VCU with DSMU software enables control of the SIU24 hardware with real-time smoke monitoring and automatic logging of session data.

4.1 User interface

Below is a screen shot of the SIU24 VCU with DSMU user interface.



- | | |
|--------------------------------------|-------------------------------------|
| 1. Operator signature | 6. Abort button |
| 2. Batch number | 7. Smoke session status parameters |
| 3. Session parameters and indicators | 8. Smoke history charts |
| 4. Start button | 9. Smoke monitoring feedback charts |
| 5. Pause button | 10. Software power indicator |


4.2 Setting up a new smoke session

Follow the steps below to set up a new smoke session.

1. Enter an operator signature, maximum ten characters, and make sure that the two power indicators are lit (both the software power indicator and the VCU hardware power LED). The batch number is generated automatically!
2. Set up the session parameters:

Cigarettes	Specifies the number of cigarettes to be used during the current session.
Puffs	Specifies the number of puffs per cigarette to be used during the current session.
Lighter	Specifies the number of seconds the lighter should be turned on in order to light each cigarette.
Smoke valve	Specifies the number of seconds the smoke input valve should be open.
Air valve	Specifies the number of seconds the air input valve should be open.
3. Press the START button to start the session.

 *The SIU24 power is turned on only when the operator signature is set!*

 *All parameters must be set in order to start the session.*

 *It is possible to change the session parameter values during session!*

4.3 Session indicators and parameters

During a smoke session the following indicators, parameters and charts display the current session status:

Power	Indicates that the SIU24 VCU power is ON
Lighter	Indicates that the lighter is turned ON
Smoke valve	Indicates that the smoke valve is OPEN
Air valve	Indicates that the air valve is OPEN
Current cigarette	Displays the current cigarette
Current puff	Displays the current puff of the current cigarette

4.4 Smoke monitoring feedback charts

The smoke monitoring feedback charts display the signal associated with smoke input and output of the SIU24 unit. Chart scales may be set manually by changing the preset axis values.

4.5 Smoke input/output history charts

The smoke input/output charts displays values associated with the smoke concentration in the test chamber. Chart scales may be set manually by changing the preset axis values.

4.6 Pausing a smoke session

Press the PAUSE button to pause the current session. To continue the session press the START button.



When continuing a paused session the current cigarette will be cancelled and the next one will be loaded automatically.

4.7 Aborting a smoke session

To abort the current session press the ABORT button.



The SIU24 VCU application will still save the session data even if the smoke session is aborted!

4.8 Log files

The files associated with the logging functions (data files and charts) are located in the installation sub-folder `\SIU48_log_files`. The session parameters are written to the `SIU.log` file located in the installation folder.

The log files are unformatted text documents and can be opened by any standard text editor or spreadsheet application.

5. Operation and maintenance

The SIU24 operation and maintenance routines are often worked out by each company and adapted to each specific research. The operation and maintenance recommendations presented in this chapter are to be viewed as guide lines for a more detailed routine description.

5.1 Cigarettes

Promech Lab recommends the reference cigarettes provided by The College of Agriculture Reference Cigarette Program (Kentucky). Visit <http://www.ca.uky.edu/refcig/> for ordering details and cigarette information.

The reproducibility of smoke sessions is highly dependent on the properties of the cigarettes. For instance, if the cigarettes are very dry they burn much faster. In order to reduce the effects from cigarette variations a detailed routine for cigarette handling is crucial. A routine outline is presented below.

- store the cigarettes in a freezer
- take the cigarettes out of the freezer and put them in a refrigerator on the day of use
- put the cigarettes in room temperature 20 minutes before the smoke session begins

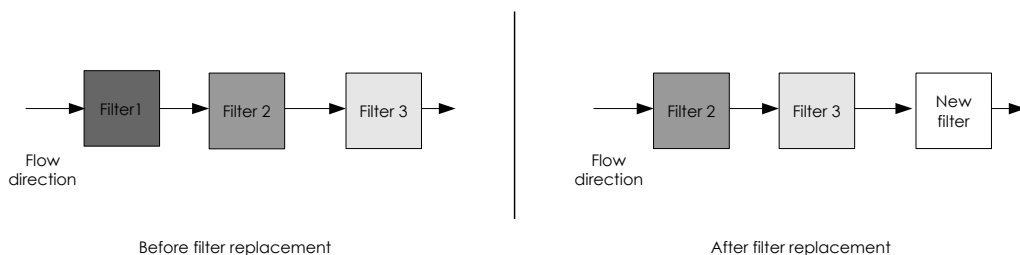
5.2 Rubber tubes

The yellow rubber tubes need to be replaced if they begin to get dry or if small cracks appear at the tube ends. Inspect the rubber tubes thoroughly to prevent system leakage.

5.3 Filters

The Marquet filters are to be replaced one at the time following the principle described in this section. The time interval between replacements depends on how the SIU24 system is used.

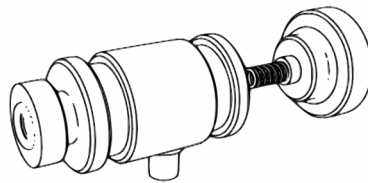
When Filter 3 begins to darken, remove Filter 1 and place a new filter according to the illustration below.



5.4 Daily maintenance

To ensure a good work environment and reliable system performance, daily maintenance of the SIU24 cigarette smoking machine is necessary. Therefore, after each smoke session it is important to:

- empty the cigarette ash tray and clean it
- remove the cigarette wheel and wipe it clean, remove any remaining cigarette ends or cigarette ashes
- remove the mouth piece and unscrew the back-end, make sure the spring does not fall off. Clean the mouthpiece (preferably, use an ultrasonic cleaner)



Mouthpiece.

- protect the bottom of the polycarbonate smoke chamber with a paper or plastic sheet, the sheet can then be replaced after each smoke session

6. Contact and support

Address	Phone	Internet
Promech Lab Holding AB Almviksvägen 41 SE-218 45 Vintrie Sweden	+46 40 154490	www.promech.se info@promech.se

7. Technical data

Item	Manufacturer	Properties	Specifications
Power supply	Mascot Model 2020	Input power	100-240VAC 50-60Hz max 1.2A
		Output power	24VDC / 2.5A
Laser diode	Melles Griot, class 3A	Current, supply	70mA
		Power, output	3mW
		Voltage supply	max. 6V
		Voltage supply	min. 3V
		Wavelength, peak	780nm
Photo diode	Hamamatsu	Back current, max	5V
		Wavelength	320-1000nm
		Peak	960nm

8. Declaration of Conformity

Product/System: Smoke inhalation unit 24

We herewith declare that the product designated above is in compliance with the basic requirements of the applicable EC-directives stated below with regard to design, type and model sold by us. This certificate ceases to be valid if the product is modified without the agreement of the manufacturer.

Machine directive: 2006/42/EG

Low-Voltage Directive: 2006/95/EG

Management systems: EN ISO 9001

Vintrie, August the 19th 2010

Jürgen Persson, CEO