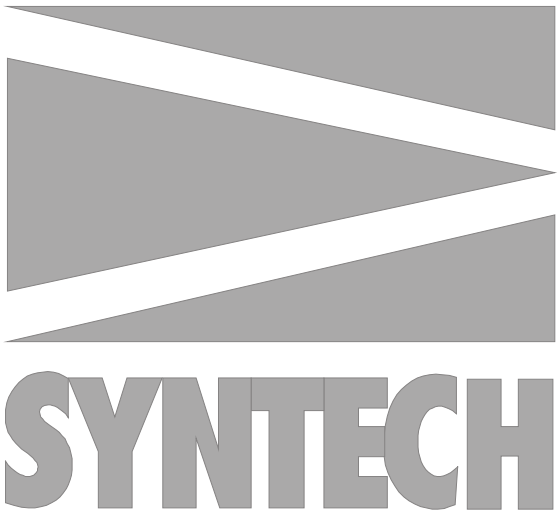
STIMULUS CONTROLLER, Type CS-55

INSTRUCTIONS

SYNTECH
RESEARCH & EQUIPMENT
Gewerbestrasse 3
79256 Buchenbach
Germany
Fax: +49 7661 989 603
Tel: +49 7661 989 604
E-Mail: info@syntech.nl

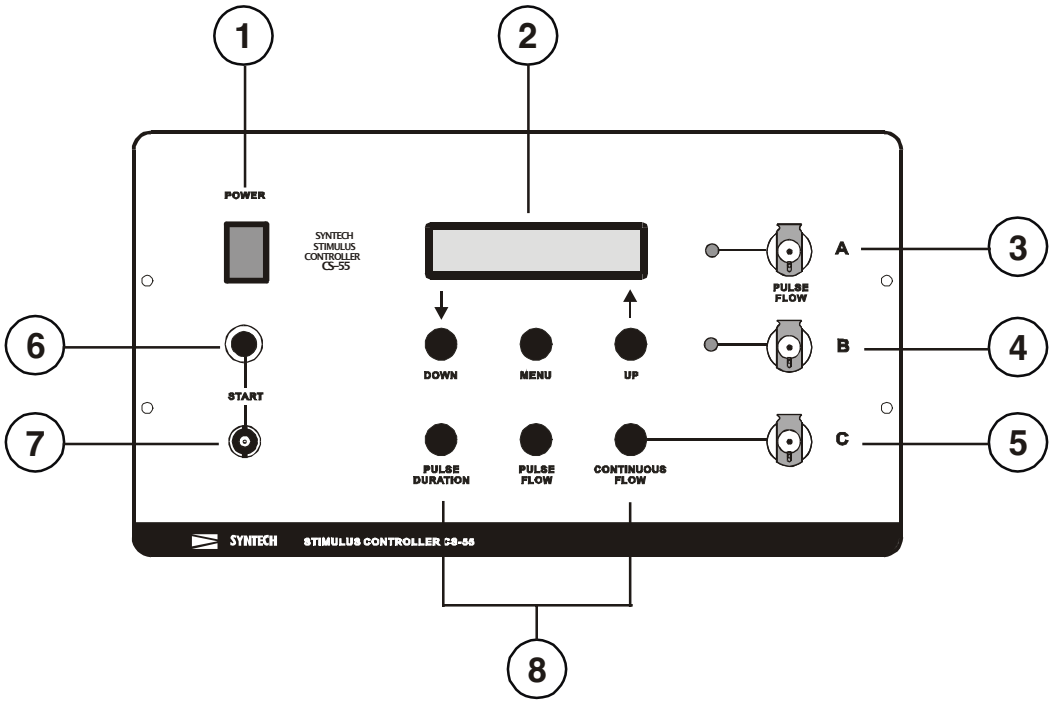


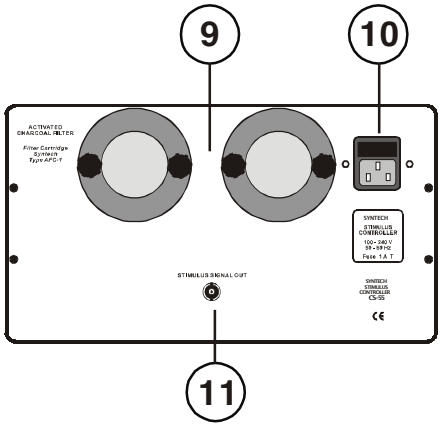
SYNTECH
RESEARCH & EQUIPMENT
Gewerbestrasse 3
79256 Buchenbach
Germany

Fax: +49 7661 989 603
Tel: +49 7661 989 604

E-Mail: info@syntech.nl

STIMULUS CONTROLLER CS-55





1. Power switch
2. LCD Display
3. Normal Air Pulse Outlet
4. Complimentary Air Pulse Outlet
5. Continuous Air Outlet
6. Start Button
7. External Start Command Input (Pedal switch)
8. Program Buttons
9. Activated Charcoal Filter Holder
10. Mains Power (100 - 240 V; 50 - 60 Hz) Receptacle
11. Stimulus Signal Output

SYNTECH RESEARCH & EQUIPMENT
Gewerbestrasse 3
79256 Buchenbach
Germany
Fax: +49 7661 989 603
Tel: +49 7661 989 604
E-Mail: info@syntech.nl

STIMULUS CONTROLLER, CS-55

The Stimulus Air Controller CS-55 is an autonomous apparatus designed to deliver controlled air flows for application in chemoreception research. Two independent air flows are created by means of miniature membrane pumps.
The pumps are arranged in such a way that the vibrations, which are typical for this kind of pumps, are minimized.

The output flow rates of the pumps can be adjusted. One of the outputs can be pulsed by means of an adjustable timer. The flow and timing control circuits are microprocessor controlled.

The air is purified by an replaceable activated charcoal filter at the air inlet.

INSTALLATION and OPERATION

1. Connect the power cord. Power range: 100 - 240 V; 50 - 60 Hz.

2. Connect the pedal switch.

3. Make a tube connection from the outlet of the continuous flow (5) to the mixing tube, which is directed to the antennal preparation.

4. Connect the stimulus source (Pasteur pipette) by means of a flexible tube to the NORMAL (A) pulse flow outlet (3).

5. Switch the unit on by activating the POWER switch (Nr.1)
   The LCD indicator should light up; if this is not the case check the fuse inside the power cord receptacle (10) at the rear of the box.

6. Adjust the continuous flow rate by pressing the pulse flow button and using the arrow buttons. Press the button again to return to standby mode.
   A moderate flow should be blown over the antennal preparation.

   The optimum flow rate (in the range of 10 – 50 cm/s) is dependent on the diameter of the flow tube and is best found by trial and error with a fresh antennal preparation.
   Avoid vibration of the preparation, which might be induced by too high flow rates.

7. Adjust the flow rate of the pulse flow by pressing the pulse flow button and using the arrow buttons). The pulse flow can be measured from the B (complementary)outlet (4). This outlet delivers the adjusted flow continuously, but is interrupted during delivery of a pulse from the NORMAL (A) outlet (3).

8 Press the START button or the start pedal.
   An air pulse is delivered from the NORMAL (A) outlet, the flow from outlet B is interrupted, and the action is indicated by the LCD indicator.

9. Adjust the stimulus pulse duration by pressing the Pulse duration button and using the arrow buttons. Return to normal mode by pressing the Pulse duration button again.
   The most appropriate pulse duration in combination with a certain flow is best determined at the beginning of a recording session.
   Short pulses induce less adaptation in the antenna, but may elicit lower EAG responses.

10 Place a stimulus pipette and insert the tip of the pipette into the side hole of the mixing tube.

SYNTECH RESEARCH & EQUIPMENT
Gewerbestrasse 3
79256 Buchenbach
Germany
Fax: +49 7661 989 603
Tel: +49 7661 989 604
E-Mail: info@syntech.nl

11 Press the start pedal.
Watch the EAG signal on the display screen of the signal processing system (oscilloscope or PC program) and make any necessary adjustments.

FLOW MEASUREMENT

The flow rate delivered by the outputs can be easily measured by means of a suitable flow meter. To measure the flow of the CONTINUOUS output simply connect the flow meter temporarily to the associated tube.
For accurate measurements it is recommended to measure the flow using the same tube as applied in the actual EAG set-up.

The pulsed flow output can be measured from outlet B (4), which delivers the same flow rate as the A (3) output during activation.

Measurement of the pulsed output in VOLUME per PULSE can be achieved by connecting a sensitive "soap film" flow meter (such as used for carrier gas flow measurement in gas chromatographs) to the outlet of the stimulus source Pasteur pipette. The displacement of the soap film during the selected pulse period can thus conveniently be gauged.

The actual flow rate is not critical in general EAG experiments. For reasons of compatibility the continuous air flow is preferably reported as linear air speed (m/s) over the preparation, whereas the stimulus flow is best expressed in volume per time (ml/s).

STIMULUS PULSE FLOW COMPENSATION

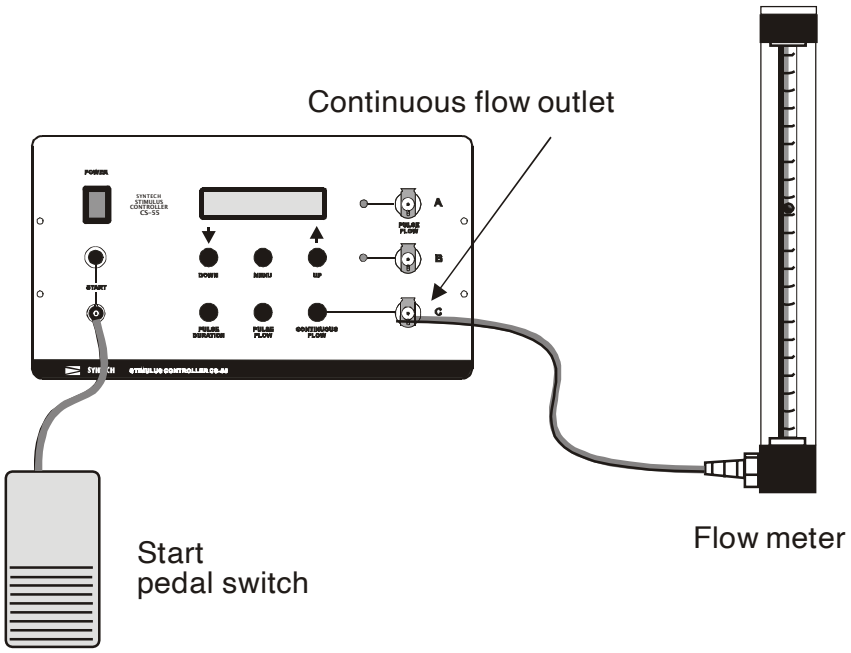
During application of a stimulus the total air flow over the preparation is temporarily increased by the flow introduced from the stimulus pipette.
Depending on the sensitivity of the preparation to mechanical stimulation this "pressure shock" may induce a significant response.
This effect can be considerably reduced if the air flow from the B (4) output is combined with the CONTINUOUS air flow. During stimulation the flow from the B outlet is blocked, but delivered (via the odour source) from the A outlet at the same rate.

ACTIVATEDCHARCOAL REPLACEMENT

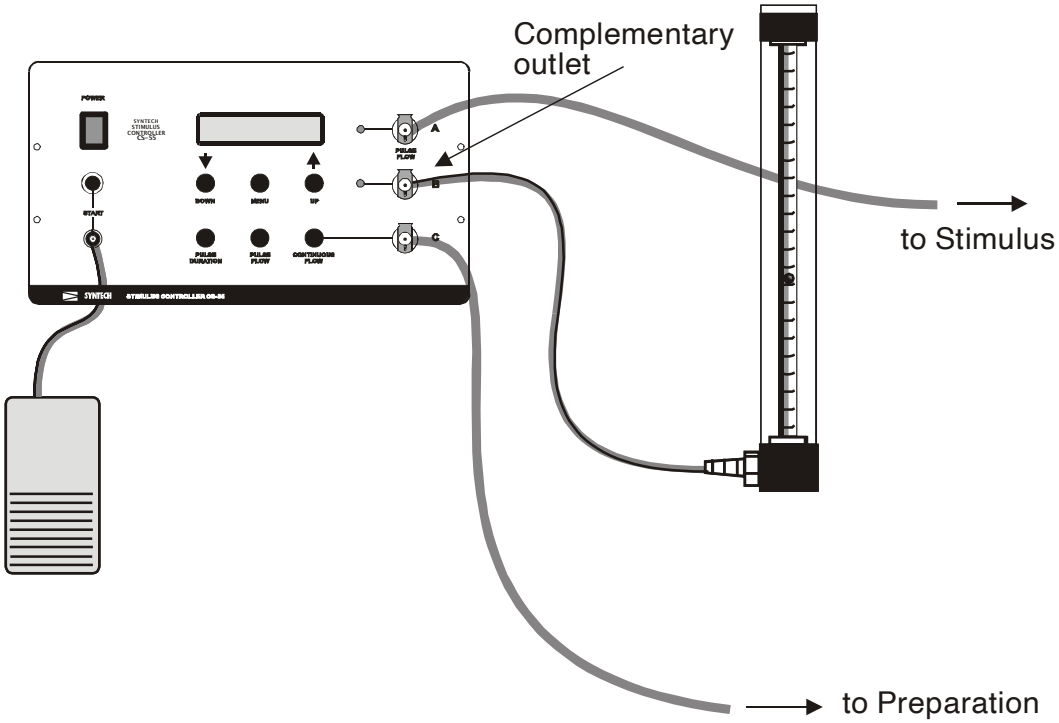
The activated charcoal inlet filter is accessible from the rear of the instrument.
Unscrew the cover and remove the filter cartridge. The cartridge can be replaced or be regenerated by heating in an inert atmosphere at elevated temperature during several hours.

SIGNAL OUTPUT

The stimulation pulse signal is available from the BNC connector (11) present at the rear panel of the instrument as a positive or negative going (to be set in the Menu: Trig. Output Pol) 12 V signal with the same duration as the stimulus pulse.
This signal can be used to monitor the stimulus pulse on an oscilloscope, recorder or any other electronic device, and as a trigger signal to start signal acquisition.

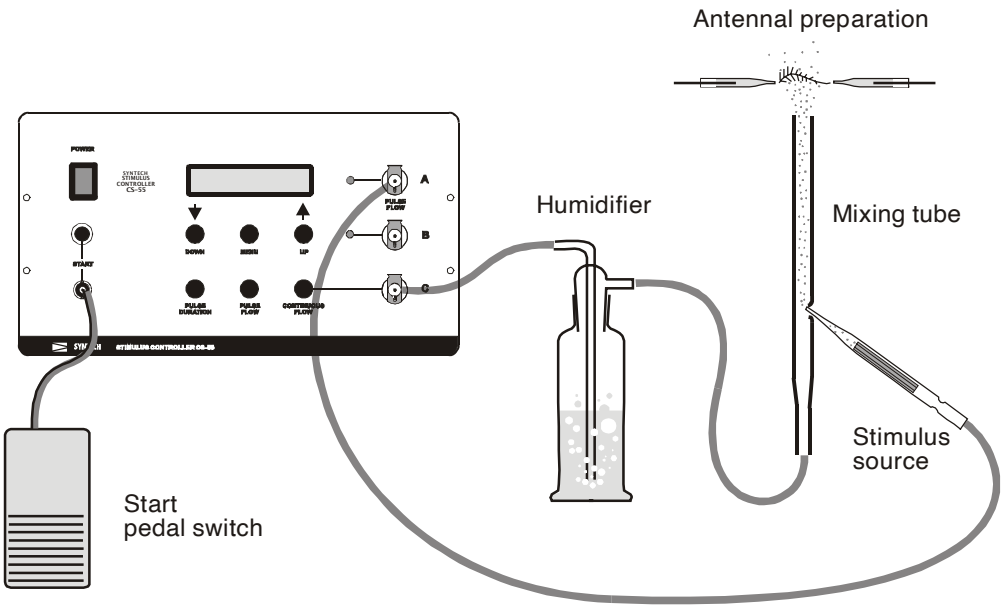


Continuous flow measurement

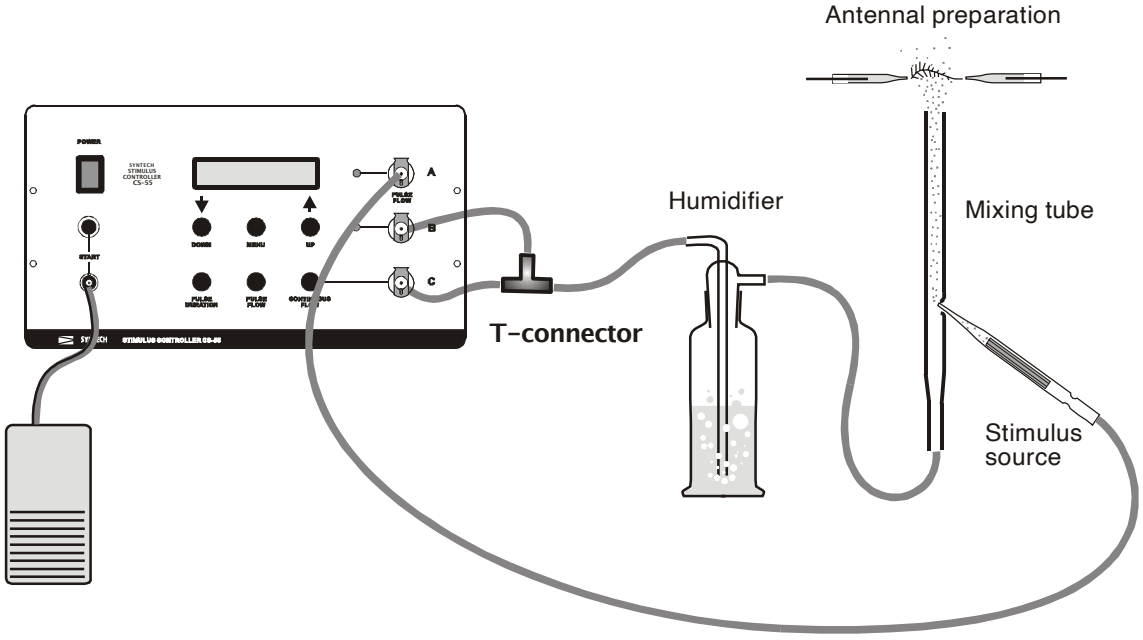


Pulse flow measurement

SYNTECH
RESEARCH & EQUIPMENT
Gewerbestrasse 3
79256 Buchenbach
Germany
Fax: +49 7661 989 603
Tel: +49 7661 989 604
E-Mail: info@syntech.nl



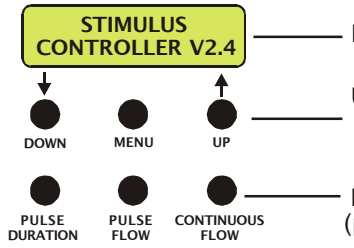
Standard tube arrangement



Arrangement for pulse flow compensation

SYNTECH RESEARCH & EQUIPMENT
Gewerbestrasse 3
79256 Buchenbach
Germany
Fax: +49 7661 989 603
Tel: +49 7661 989 604
E-Mail: info@syntech.nl

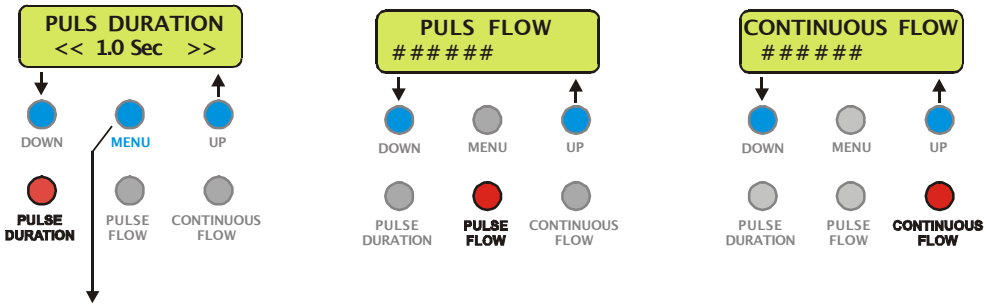
STIMULUS CONTROLLER CS-55
SETTINGS



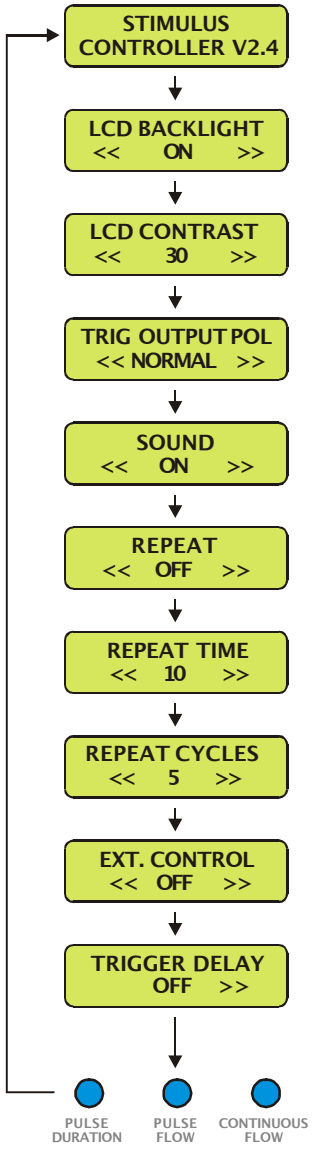
Initial display text: Embedded software version (V2.4)

Upper 3 buttons: Menu control and settings
Arrow buttons: change menu settings
To leave MENU: press one of 3 lower buttons

Lower 3 buttons: Pulse duration and Flow adjustment
(press one time to adjust - second time to return to normal)



MENU Press MENU button to scroll through menu options



Initial display text: Embedded software version (V2.4)

Display Backlight: ON - OFF

Display Contrast: 0 - 60

Trigger Output Polarity: Output signal (# 11 at rear panel):
Normal (positive going) - Inverted (negative going)

Action Indicating BEEB sound: ON - OFF

Automatic Repeat: ON - OFF (Normally OFF)

Repeat Interval time: 1 - 100 s (when Repeat option is ON)

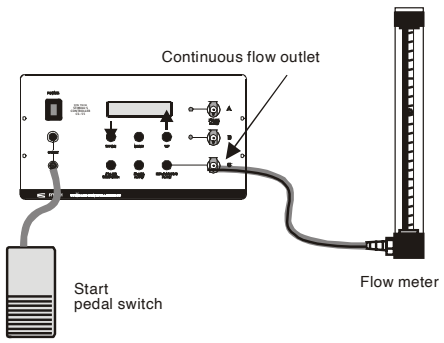
Number of repeat cycles: 1 - 100 (when Repeat option is ON)

Direct control: OFF (normal) - ON (control by external timing signal
connected to Pedal switch receptacle (# 7 on front panel)

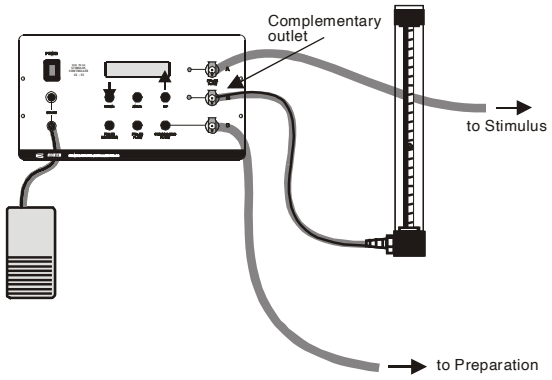
Trigger delay: OFF (0) or 0.1 - 100 s.
Delay between activation of START button and actual output air pulse.

To leave the MENU mode press any of the 3 lower buttons
(after 10 s of no action the system leaves the menu automatically)

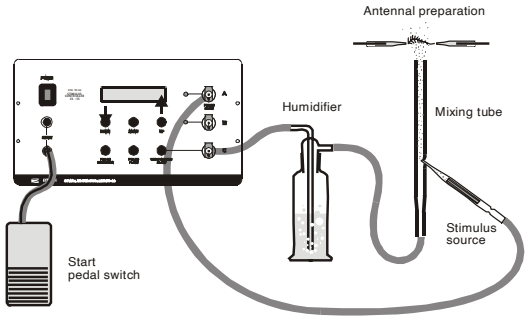
SYNTECH
RESEARCH & EQUIPMENT
Gewerbestrasse 3
79256 Buchenbach
Germany
Fax: +49 7661 989 603
Tel: +49 7661 989 604
E-Mail: info@syntech.nl



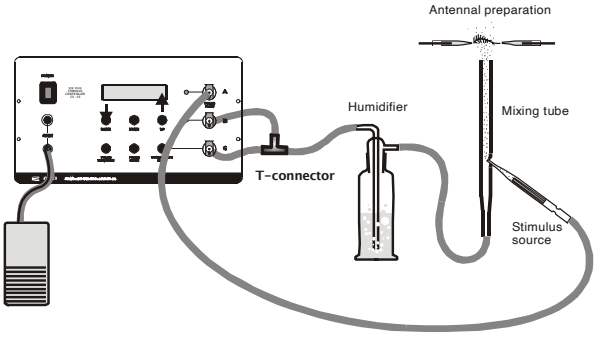
Continuous flow measurement



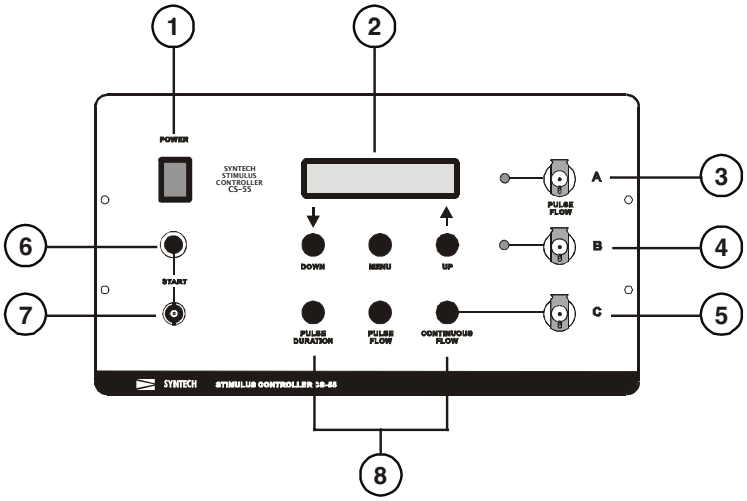
Pulse flow measurement

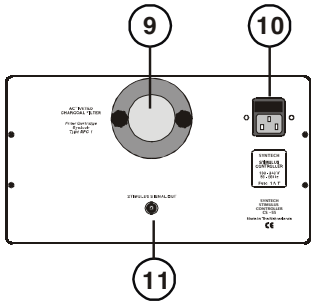


Standard tube arrangement



Arrangement for pulse flow compensation





1. Power switch
2. LCD Display
3. Normal Air Pulse Outlet
4. Complimentary Air Pulse Outlet
5. Continuous Air Outlet
6. Start Button
7. External Start Command Input (Pedal switch)
8. Program Buttons
9. Activated Charcoal Filter Holder
10. Mains Power (100 - 240 V; 50 - 60 Hz) Receptacle
11. Stimulus Signal Output

SYNTECH
RESEARCH & EQUIPMENT
Gewerbestrasse 3
79256 Buchenbach
Germany
Fax: +49 7661 989 603
Tel: +49 7661 989 604
E-Mail: info@syntech.nl