

Userguide

No 030 | Concentrator plus / Vacufuge® plus

Connecting an external vacuum pump to the Concentrator plus*

*Product Name in North America: Vacufuge® plus

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Abstract

This Userguide explains the minimum properties that an external vacuum pump must fulfil in order to meet the specifications for the Concentrator plus and to be used purposefully and comfortably. Furthermore, options for connecting a vacuum pump to the basic device with the corresponding Eppendorf accessories are described, and operational notes are provided.

Introduction

The Concentrator plus was developed for the concentration, drying and cleaning of DNA, RNA and protein samples up to a maximum of 240 ml aqueous or alcoholic solutions. Two versions are available: the complete system with an integrated membrane vacuum pump, with an optional connection for an additional device, such as a gel

dryer, and the Concentrator plus basic device. The latter must be connected to an external vacuum pump in order to be used correctly.

This Userguide focuses on the connection of an external vacuum pump to the Concentrator plus basic device.

Requirements of an external vacuum pump

In order to achieve the specifications for the Concentrator plus, a vacuum pump must have the following performance data:

Ultimate pressure (absolute): < 20 mbar (20 hPa)
Resistance to chemicals: in accordance with application
Pumping speed: > 1.8 m³/h

Vacuum pumps that meet these requirements can, for example, be membrane or rotary vane pumps. The specifications can be found in the technical data for the vacuum pump. If this is not available, inquire at the manufacturer.

The manufacturer is the contact partner for all further questions regarding the correct operation of the vacuum pump, e.g. operation, usage, performance, maintenance, troubleshooting or specification and connection of cold traps.

The stability of the basic device has been tested up to a vacuum of 2×10^{-2} mbar. However, the Concentrator plus was developed for the concentration of aqueous or alcoholic solutions, for which a vacuum below 20 mbar is sufficient.

Using a vacuum pump with < 400 W power consumption

An external vacuum pump¹ with a power consumption of < 400 W can be connected directly via the Eppendorf special plug (Figure 1) to the Concentrator plus basic device in order to be supplied with power. This way, the Concentrator plus takes over the control of the vacuum, in accordance with the configured solvent function, and ventilates the chamber at the end of the run. The vacuum pump switch can remain activated throughout this connection option.

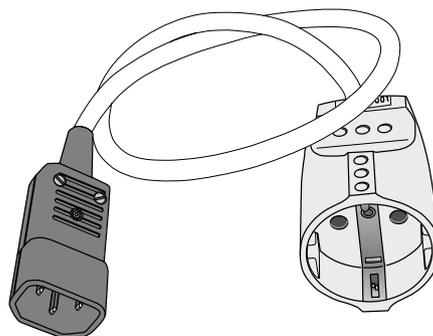


Figure 1: Special plug² for control and power supply using a vacuum pump with < 400 W power consumption.
Male connector (black): connection with Concentrator plus basic device via bushing provided on the rear side of device;
Receptacle (white): connection with mains cable of the vacuum pump¹

Material:

- Eppendorf Concentrator plus basic device
- Eppendorf special plug ^{2/3} for external vacuum system
- Vacuum pump (power consumption < 400 W)¹
- Connecting hose (approx. 50 cm in length, 8 mm internal diameter, resistant to vacuum and chemicals)¹

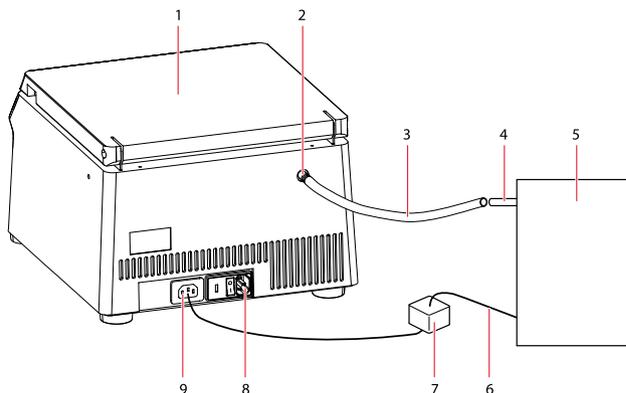


Figure 2: Connecting a vacuum pump¹ with < 400 W power consumption to the Concentrator plus basic device

Perform the following steps to connect the vacuum pump to the Concentrator plus basic device (see Figure 2):

1. Disconnect the basic device (1) and vacuum pump (5) from the power supply
2. Insert the mains cable from the vacuum pump (6) into the Eppendorf special plug (7)
3. Insert the special plug in the bushing (9) provided on the rear side of the basic device (connected mains voltage!)

4. Use the connecting hose (3) to connect the inlet of the vacuum pump (4) and the pump connection (2) to the rear side of the basic device
5. Connect the basic device to the power supply (8)
6. Activate the basic device and make the appropriate settings for the application
7. Activate the vacuum pump
8. Start the basic device; the vacuum pump is controlled automatically
9. When the run ends, the vacuum pump is deactivated automatically
10. Switch off the basic device or start a new run

Using a vacuum pump with > 400 W power consumption

An external vacuum pump¹ with a power consumption of > 400 W must be connected directly to the main power supply. In this case, the Eppendorf solenoid valve (Figure 3), which is connected to the vacuum pump and the pump connection on the rear side of the basic device, is used to control the vacuum using the Concentrator plus basic device, in accordance with the solvent function configured. It is also used for ventilating the chamber at the end of the run. The Eppendorf solenoid valve may only be used with aqueous and alcoholic solutions.

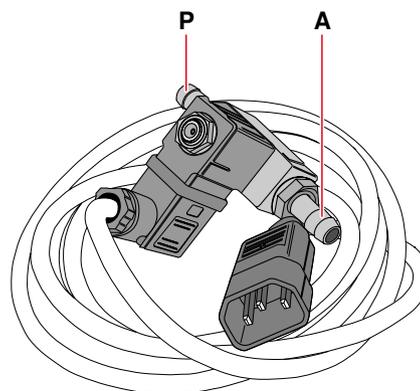


Figure 3: Solenoid valve for controlling vacuum when using a pump with > 400 W power consumption.
Male connector: connection with Concentrator plus basic device via bushing provided on the rear side of device;
Solenoid valve: hose connections P for connecting to Concentrator plus basic device, hose connection A for connecting to vacuum pump¹

Material

- Eppendorf Concentrator plus basic device
- Eppendorf solenoid valve for external vacuum system
- Vacuum pump (power consumption > 400 W)¹
- 2 Connecting hoses (approx. 50 cm in length, 8 mm internal diameter, resistant to vacuum and chemicals)¹

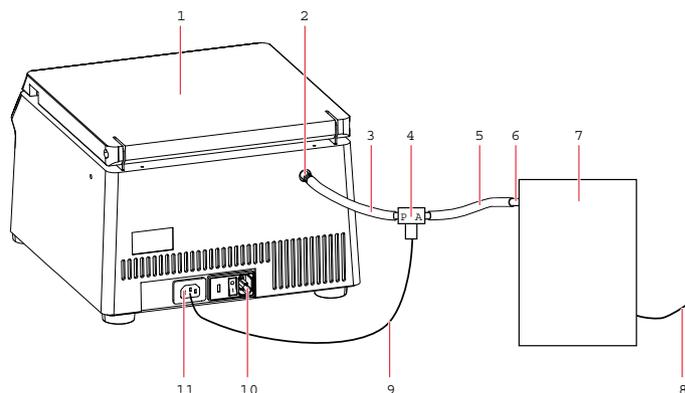


Figure 4: Connecting a vacuum pump¹ with > 400 W power consumption to the Concentrator plus basic device.

Perform the following steps (see Figure 4) to connect the vacuum pump, Eppendorf solenoid valve and Concentrator plus basic device to each other:

1. Disconnect the basic device (1) and vacuum pump (7) from the power supply
2. Use a connection hose (3) to connect the hose connection P on the solenoid valve (4) to the pump connection (2) on the rear of the basic device
3. Use a connection hose (5) to connect hose connection A on the solenoid valve (4) to the inlet of the vacuum pump (6)
4. Insert the solenoid valve's (9) special plug in the bushing provided on the rear side of the basic device (11) (connected mains voltage!)
5. Connect the basic device to the power supply (10)
6. Connect the vacuum pump to the power supply (8)
7. Switch on the basic device and make the appropriate settings for the application
8. Switch on the vacuum pump; a vacuum develops up to the solenoid valve
9. Start the basic device; the vacuum is controlled automatically.
10. When the run ends, the solenoid valve closes, thus separating the basic device from the vacuum system. The rotor chamber and the connection hose to the solenoid valve (3) are ventilated. The vacuum pump switch can remain activated between two runs when using this connection option.
11. Once the work is completed, switch off the Concentrator plus basic device
12. Ventilate the connection hose (5) between the solenoid valve and inlet of the vacuum pump and switch off the vacuum pump (see manufacturers' instructions)

General remarks

When using several devices on one vacuum system at the same time, note that an explosive mixture of gases can build up in the vacuum system. Only carry out this parallel operation with identical solvents or non-hazardous solvents!

Every Concentrator plus basic device can be upgraded to a Concentrator complete system by an Eppendorf Service provider.

If you still have any questions regarding connecting a vacuum system to the Concentrator plus basic device, please contact your Eppendorf Application Support center at support@eppendorf.com or support_asiapacific@eppendorf.com or support_na@eppendorf.com.

This user guide is an enhancement of the operation manual for the Concentrator plus / Vacufuge® plus, and does not replace this document. Please read the operation manual before using the device for the first time. The latest version of the operation manual is available on the Internet at www.eppendorf.com.

Ordering information

| Description | Order No. International | Order No. North America |
|--|-------------------------|-------------------------|
| Concentrator plus / Vacufuge® plus basic device, with 48 x 1.5/2.0ml fixed angle rotor, 230V, 50/60Hz | 5305 000.010 | – |
| Concentrator plus / Vacufuge® plus basic device, with 48 x 1.5/2.0ml fixed angle rotor, 120 V / 60 Hz | 5305 000.134 | 022820001 |
| Concentrator plus / Vacufuge® plus basic device, with 48 x 1.5/2.0ml fixed angle rotor, 100 V / 50 - 60 Hz | 5305 000.037 | – |
| Solenoid valve for external vacuum system, Only suitable for aqueous and alcoholic solvents, 230 V | 5301 030.004 | 022830104 |
| Solenoid valve for external vacuum system, Only suitable for aqueous and alcoholic solvents, 100-120 V | 5301 036.002 | 022830112 |
| Special plug ² for external vacuum system, 230 V | 5301 010.003 | – |
| Special plug ³ for external vacuum system, 115 V | 5301 033.003 | 022830110 |

¹ product not supplied by Eppendorf AG

² only for safety contact connections (german plug), changeable to local system by a specialist

³ NEMA 3-pin connector, changeable to local system by a specialist

eppendorf
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