Compliance Voltage Booster CVß120

Installation & Operation Manual

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Unpacking

Zahner products are carefully produced, calibrated and tested to achieve a high quality standard. Also the assembling of the accessories and packing is done with great care. Therefore please check the shipment directly after receipt whether the device and all accessories are undamaged.

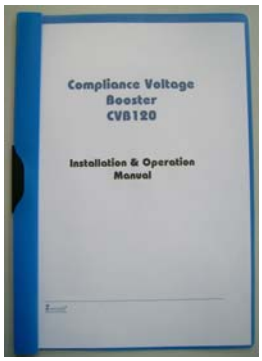
The shipment must contain the following parts:

- **1 CVB120**

- **2 cables** for connecting
  the CVB120 to the IM main potentiostat
  (Lemosa/DSub)

- **1 power cord**

- **This manual**



Caution !

The CVB120 is able to output up to 120V at 75 mA and therefore may injure you severely. Please never touch the CVB120 outlets or the cables connected to the outlets when the potentiostat is switched on!

1. **Set up the system including the CVB120-IM connections with the devices switched off!**
2. **Do not connect active objects (e.g. batteries, fuel cells, etc.) to the CVB120 outlets with the CVB120 in mains power-off mode (mains switched off)!**
3. **Do not change objects at the CVB120 inputs with the potentiostat switched on!**
4. **Do not mix up the E- and I-connectors when connecting the device to the IM6/6eX!**
5. **Fix the screws of the DSub connectors to avoid communication problems!**
6. **Never use the Zahner TestBox or DummyCell on the CVB120!**
7. **Different from the IM-potentiostat, the Working Electrode outlet of the CVB120 is hot! It may output up to 120 V! Therefore, the sequence of connecting the electrodes is different from the one used with the IM6/6eX. With the CVB120 the sequence must be: *Counter Electrode* - *Reference Electrode* – *Test Electrode Sense* - *Test Electrode Power***
8. **Switch the CVB120 on about 5 minutes before use. This will guarantee that all components are in thermal balance.**

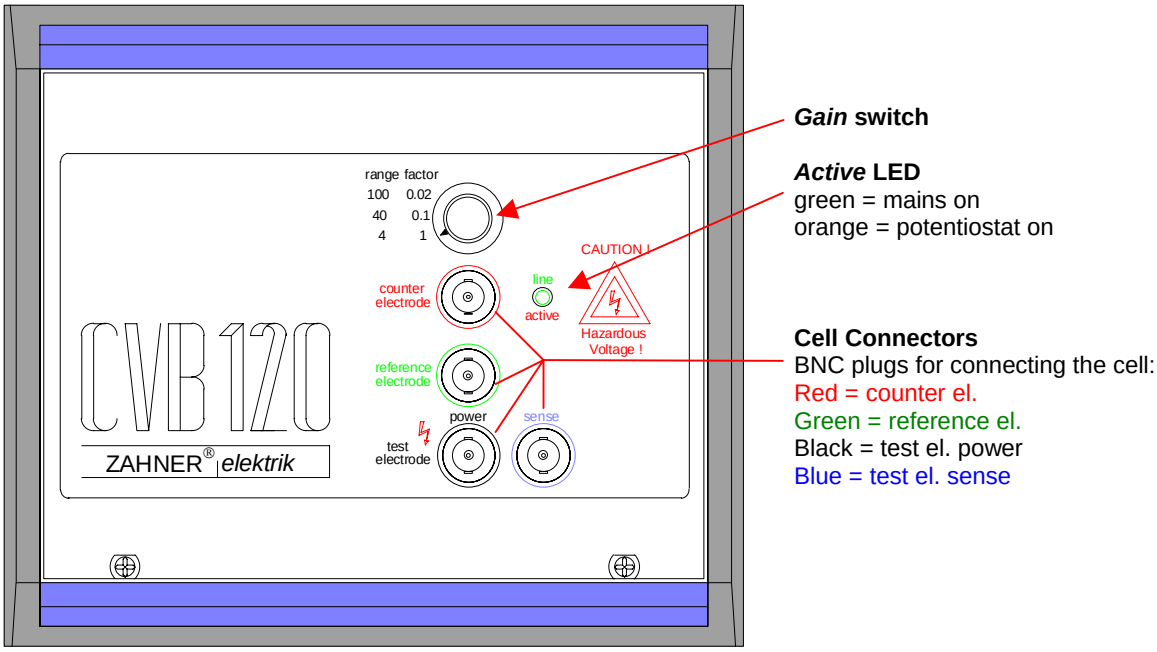
Basics

Compliance voltage is the voltage reserve, a potentiostat must provide to be able to apply a defined potential. The reason for this is the internal resistance of the counter electrode, through which the voltage is applied. This internal resistance causes a voltage drop, so that the voltage dropping at the test object is smaller. If you, for example, set a DC potential of 4 V, you want to drop 4 V at the test object. Therefore, the voltage the potentiostat has to apply must be higher. If e.g. at the counter electrode 2 V are dropping, the potentiostat has to apply 6 V.

Another application are objects with a rest potential different from 0 V. This also may be a reason for the potentiostat to apply a higher voltage to achieve a certain potential at the object.

The *IM6/6eX* systems provide a compliance voltage of +-14 V.

If high potentials are to be applied and if high potentials are to be controlled and measured, higher compliance voltages are needed. For this reason, the IM systems can be upgraded with the *CVB120* which provides a controlled voltage of up to +-100 V and a compliance voltage of up to +-120 V. The *CVB120* is a booster which is to be connected to the buffer connectors of a *IM6/6eX*.



Installation

Proceed with the following steps:

1. Disconnect all cables from the *IM6* potentiostat outlets and switch OFF the *CVB120* and the *IM* system.
2. Connect the *Probe I* cable to the corresponding outlet of the *IM* system (thicker Lemosa plug) and to the appropriate outlet of the *CVB120* (DSub *Probe I*)
3. Connect the *Probe E* cable to the corresponding outlet of the *IM* system (thinner Lemosa plug) and to the appropriate outlet of the *CVB120* (DSub *Probe E*)
4. Switch ON the *IM* system and the *CVB120*. The *Line* LED will indicate the stand-by mode
5. Connect your test object to the *CVB120* according to one of the connection schemes shown on the next page. Be sure to have the potentiostat switched OFF while connecting the cell. It is important to connect the electrodes in the following sequence:

   Counter Electrode - Reference Electrode - Test Electrode Sense - Test Electrode Power

6. Select the potential range with the gain switch. There are three positions:

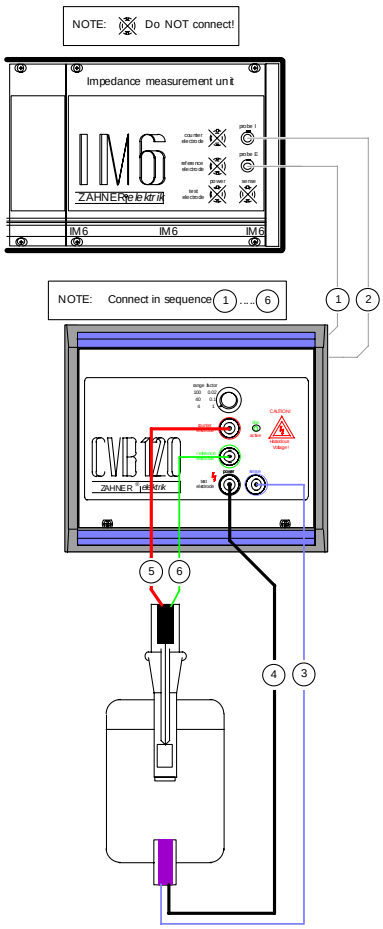
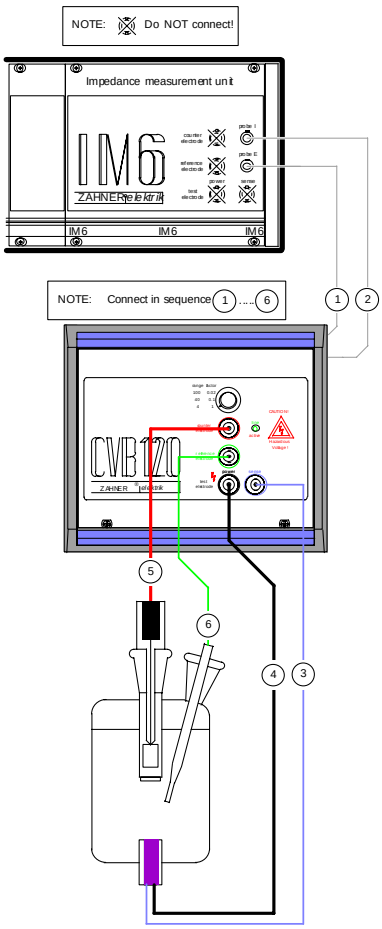
gain	potential range	compliance
1.00	± 4 V	± 15 V
0.1	± 40 V	± 120 V
0.04	± 100 V	± 120 V

7. Select the corresponding scheme in the *Check Cell Connection* page of the *Thales* software. Enter the gain factor you have selected at the *CVB120*.

!	**Make sure that the potentiostat is switched OFF when connecting the *CVB120* to the *IM* system. Do not change any hardware settings (e.g. *gain*) with the potentiostat switched ON.**

Cell Connections

As the CVB120 works like a buffer amplifier there are two connection schemes available:

Two-electrode arrangement	Three-electrode arrangement
	

Specifications CVB120

Operating modes	galvanostatic & potentiostatic
Compliance voltage	±30 V @ 300 mA ±120 V @ 75 mA
Potential ranges	±4V, ±40V, ±100V
Compliance voltage	±15V, ±120V, ±120V
Potential accuracy	±0.1% of reading ± 0.025% fs of range
Frequency range	DC to 10kHz
Power consumption	75 W
Ambient temperature	0^0C … 25^0C