

# CUY21Vitro-EX

dual pulse

## In vitro electroporator



## Features

### Dual pulse electroporation

CUY21Vitro-EX generates two different kinds of square wave pulses in tandem (refer to fig.1). One is to make a pore on cell membrane (hereafter called "Poration pulse") and the other is to drive genes or molecules into a cell (hereafter called "Driving pulse"). The poration pulse requires high voltage enough to make a pore on cell membrane. On the other hand, the required voltage of the driving pulses should be relatively lower as they are used only for electrophoresis of genes. With commercially available devices, a poration and driving pulses can not be separated mechanically. The voltage of an electroporation program must be adjusted to the level making a pore on cell membrane. However, the voltage adjusted to a poration pulse is too high for the following driving pulses (refer to fig. 2). As a result, the entire electric load on a tissue or organ is excessive and causes damage to it. In order to resolve the problem, the dual pulse electroporator was developed. One high voltage pulse with micro second pulse length and several low voltage pulses are applied respectively. The combination of high and low voltage pulses minimizes damage on cells and is expected to increase cell viability.

### Resistance measurement function

A resistance measurement function built in CUY21Vitro-EX enables one to measure the resistance value of suspension buffer prior to electroporation. The buffer can be adjusted if necessary. An electroporation can be carried out under the same physical conditions every time. The reproducibility increases considerably.

### Easy to operate

Each parameter of an electroporation program has an independent LED window. It is easy to set and edit a program. All measured values such as resistance, current and voltage are also displayed on its own LED window. It is easy to verify an electroporation process. Numerical keys enables one to enter a parameter easily.

### Actual current and voltage measurement

The voltage and current value of a poration pulse are measured and displayed immediately after an electroporation is completed. Checking voltage enables one to check the performance of a device and identify a mechanical problem immediately if there is something wrong with a device. The actual current value helps the verification of electroporation process.

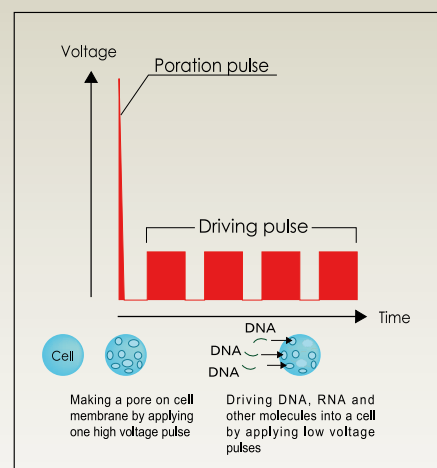


fig.1 Dual pulse electroporation

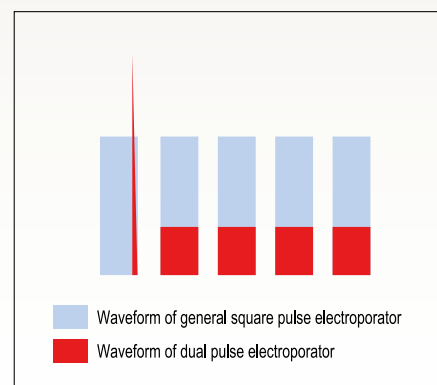


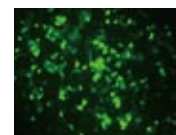
fig.2 General square pulse and dual pulse

## Various applications

The voltage ranges of a poration and driving pulse are up to 900V and 500V respectively. CUY21Vitro-EX can be used to electroporate mammalian and plant cells in a cuvette electrode and cultured cells in a well plate or petridish. CUY21Vitro-EX is very useful for the research of iPS cells.

## 99 programs

Up to 99 programs can be saved.



COS-1 GFP expression



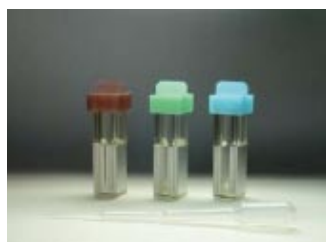
HEK-293 GFP expression

## Accessory

### Cuvette holder SE-2



### Cuvette electrode



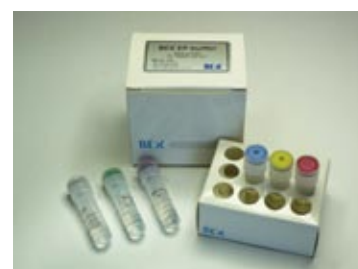
Cat no	Description	Capacity	Cap color
SE-201	1mm gap cuvette 50 pcs/bag	20 ~ 80μl	Brown
SE-202	2mm gap cuvette 50 pcs/bag	40 ~ 400μl	Green
SE-204	4mm gap cuvette 50 pcs/bag	200 ~ 800μl	Blue

A disposal pipette is included in each cuvette.

## Electroporation buffer

EP buffer improves the transfection efficiency and cell viability considerably

Cat no	Description	Components
BEP-FL01*	BEX EP buffer Full kit	BEX EP buffer A (Green label) 1ml BEX EP buffer B (Purple label) 1ml BEX EP buffer C (Blue label) 1ml BEX EP buffer D (Yellow label) 1ml BEX EP buffer E (Red label) 1ml Solution (10 time use per each kind of buffer)
BEP-GLA5	BEX EP buffer A	BEX EP buffer A (Green label) 1ml × 5 tubes Solution (50 time use)
BEP-PLB5	BEX EP buffer B	BEX EP buffer B (Purple label) 1ml × 5 tubes Solution (50 time use)
BEP-BLC5	BEX EP buffer C	BEX EP buffer C (Blue label) 1ml × 5 tubes Solution (50 time use)
BEP-YLD5	BEX EP buffer D	BEX EP buffer D (Yellow label) 1ml × 5 tubes Solution (50 time use)
BEP-RLE5	BEX EP buffer E	BEX EP buffer E (Red label) 1ml × 5 tubes Solution (50 time use)



## Specification

Pulse	Poration pulse		Driving pulse
DC pulse waveform	Square wave		
Voltage range	1 ~ 900V (1V increment)		1 ~ 500V (1V increment)
Pulse length range	0.01 ~ 99.9 msec. (0.01msec increment)		0.1 ~ 99.9 msec. (0.1msec increment)
Pulse interval range	0.05 ~ 99.9 msec. (0.01msec increment) *1		1 ~ 999 msec. (1msec increment)
No of pulses	1		1 ~ 10 pulses
Resistance measurment range	Max 30KΩ	Memory	99 programs
Current measurement range	1 ~ 500V	Power	Single phase 100V 500VA 50/60Hz
Voltage measurement range	0.1 ~ 50A	Dimensions/weight	W360mm X D380mm X H180mm, 10.5Kg

\* 1 Interval between poration and driving pulse

\* Product specifications are subject to change without notice