

Technical Data Sheet 4D-Nucleofector™

Technische Daten, Specifications, Spécifications

Spannung / power / électrique	100 - 240 VAC
Frequenz / frequency / fréquence	50-60 Hz
Stromverbrauch / consupcion / consommation - power off / idle / busy	0 VA / 20 VA / 140 VA (during transfection)
Sicherung / fuse / fusible	T 2.5A, L250V
Betriebsumgebung / operating temperature Environnement	+15°C up to 40°C (59°F – 104°F) non condensing
Transfektionen / Minute, transfections / minute, transfections / minute	16 – 32 using 16-well Nucleocuvette™ Strips 20 – 26 using 100 µl Nucleocuvettes™ 8 – 10 using Y Unit
Interface	RS422, USB, Lonza Interface for module connection Shuttle HV Out (X Unit only)
Spannungsbegrenzung / voltage limitation / limitation de tension	1500 V
Strombegrenzung / current limitation / limitation de courant	100 A
Klassifikation/ classification/ classification	IP 20– protection against foreign materials splashproof until 15° inclination Group 1, Class B
Abmessungen / dimensions / dimensions	24.5×10.5×28 cm / 9.7×4.1×11.0 of single unit
Gewicht / weight / poids	Core Unit: 4.4 kg (9.7 lb) X Unit: 4,7 kg (10.4 lb) Y Unit: 5,0 kg (11.0 lb)
Hersteller / supplier / manufacture	Lonza Cologne GmbH Nattermannallee 1 D-50829 Köln Germany



The Advanced Platform: 4D-Nucleofector™ System Offering Multi-dimensional Flexibility

Based on numerous user feedback, Lonza engineers and scientists have developed the new innovative 4D-Nucleofector™ System. This system is designed for maximum flexibility and enables Nucleofection™ of cells in several formats combined with advanced performance and convenience.

The 4D-Nucleofector™ System is a modular system comprising one Core Unit and the X Unit as first available functional unit. Core and X Unit can be assembled side by side or on top of each other. Due to its modular design the 4D-Nucleofector™ System is extremely flexible in regard to the supported applications.

What Benefits Are Important for Your Work?

Using Different Cell Numbers for Different Applications?

- Same protocol for 100 µl and 20 µl transfection volume
- 100 µl Nucleocuvette™ for high cell numbers up to 2×10^7
- 20 µl Nucleocuvette™ Strip for low cell numbers down to 2×10^4

Working with Various Throughputs?

- Flexible throughput from 1 to 16 samples
- Parallel processing of one or two 100 µl Nucleocuvette™ Vessels
- Pre-programming of settings for up to 50 single 100 µl Nucleocuvette™ Vessels or one 20 µl Nucleocuvette™ Strip
- Kit costs tailored to your throughput

Transfecting Different Primary Cell Types?

- Only 5 primary cell kits covering a broad range of primary cells
- New Primary Cell Optimization Kit for cells lacking an Optimized Protocol
- Easy optimization of a variety of cell lines using the 96-well Shuttle™ Add-on Device

Preserving Cell Functionality?

- Adherent Nucleofection™ of neurons at later developmental stages
- No release of metal ions due to conductive polymer electrodes



1 The Core Unit – Controlling the 4D-Nucleofector™ System

- Intuitive operation software for designing and saving experiments
- Predefined Nucleofection™ Parameters and Experiments
- PC editor for predefinition of experiments
- 5.7" foldable touch screen to operate the system
- Controls up to 5 functional units
- USB port for software update and data transfer
- Comprises USB and serial connectivity for the 96-well Shuttle™ Device

2 The X Unit – Supporting Nucleofection™ of Various Cell Numbers in Different Formats

- Features positions for 20 µl Nucleocuvette™ Strips and 100 µl single Nucleocuvette™
- Seamless transfer of conditions between different Nucleofection™ Vessels
- Suited for Nucleofection™ of cells in adherence in 16-well Nucleocuvette™ AD Strips
- Comprises HV connectivity for the 96-well Shuttle™ Device

3 The Y Unit – Enabling Adherent Nucleofection™ in 24-well Culture Plates

- Features position for one 24-well Dipping Electrode Array

The Most Flexible Unit: 4D-Nucleofector™ X Unit

Different Vessels for Flexible Cell Numbers

The X Unit of the 4D-Nucleofector™ System can handle two different Nucleocuvette™ Vessels both composed out of the same conductive polymer electrode material:

Single 100 µl Nucleocuvette™ Vessels:

- Novel conductive polymer 100 µl cuvettes replacing former aluminum cuvettes
- For high cell numbers at low throughput (e.g. for biochemical applications or Western Blots)



16-well 20 µl Nucleocuvette™ Strips

- Same strips as those assembled to a 96-well Nucleocuvette™ Plate
- For low cell numbers at medium throughput (e.g. reporter gene assays, RNAi)
- Alternative version available for adherent Nucleofection™



Same Conditions for Different Cells Numbers

As the same electrode material is now used for 20 and 100 µl cuvettes, Nucleofection™ Conditions are transferable between the different Nucleocuvette™ vessels offering maximum flexibility and convenience:

- Once the conditions are known for one format they can be easily transferred to the other format.
- Conditions are transferable between different throughput formats (4D-Nucleofector™ System, 96-well Shuttle™ Device and HT Nucleofector™ System).
- Existing 96-well Shuttle™ Protocols can be used with the 4D-Nucleofector™ system.

Transferability Between Nucleofection™ Conditions Between Different Formats

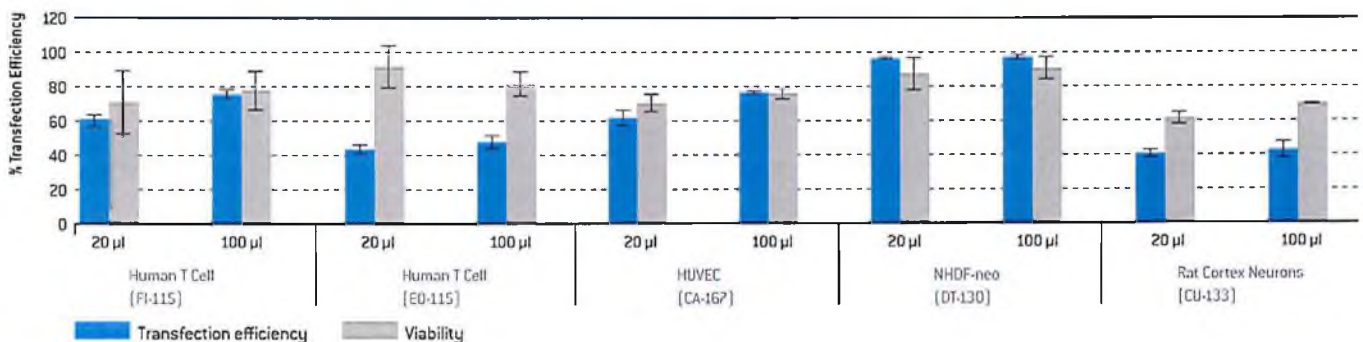


Figure 6. Various primary cells were transfected in the two Nucleocuvette™ vessel formats (20 µl and 100 µl) using the indicated programs. Twenty-four hours post Nucleofection™ cells were analyzed for transfection efficiency (flow cytometry) and viability (cell number normalized to no program control).