CyBio
An Analytik Jena Company

CyBi®-SELMA – Basic Information

Introduction

CyBi®-SELMA is a semi-automatic pipettor for quick, precise and reproducible processing of 96-well and 384-well microplates. Equipped with 96 or 384 parallel working tips of different sizes (1 ml - 10 µl) it is easy to operate without the need for a separate computer control system. Applications like microplate replication and reformatting, media exchange as well as dilution can be executed reproducibly and conveniently. The basic functions Pipetting, Reverse Pipetting, Dispensing and Diluting can be selected on a modern touch screen, for Serial Dilutions a special magazine is provided. Furthermore flexible liquid handling parameters like volumes, pipetting heights and pipetting speeds can be defined via the touch screen. For recurrent processes all liquid handling parameters can be saved and thus recalled conveniently at any time as needed.

Figure 1:
The CyBi®-SELMA 384, 25 µl with 25 µl tips and 2 working positions

Technical Data

Table 1 summarizes the technical data of the CyBi®-SELMA family.

General

Channels	96 or 384
Pipetting head	capable of motorized motion in z-direction
Memory capacity	> 10 parameter sets per pipetting mode
Microplate formats	96/384 Shallow Well (SW); Deep Well (DW)
Plate positions	2

Pipetting heads

96 channel heads   *NEW*

Device	**96/25 µl**	**96/60 µl**	**96/250 µl**	**96/1000 µl**
Volume range	0.5 µl…25 µl	1 µl…60 µl	5 µl…250 µl	10 µl…1000 µl
Precision (CV)	2 µl…5 µl ≤ 2%; > 5 µl…25µl ≤ 1%	3 µl…5 µl ≤ 2%; > 5 µl…60µl ≤ 1%	10 µl…25 µl ≤ 2%; > 25 µl…250 µl ≤ 1%	25 µl…100 µl ≤ 2%; >100 µl…1000 µl ≤ 1%
Tip types	10 µl (SW), 25 µl (SW), 60 µl (DW)	10 µl (SW), 25 µl (SW), 60 µl (DW)	250 µl (SW/DW)	1000 µl (DW)
Order No.	OL7001-26-211	OL7001-26-212	OL7001-26-213	OL7001-26-214

384 channel heads

Device	**384/25 µl**	**384/60 µl**
Volume range	0.5 µl…25 µl	1 µl…60 µl
Precision (CV)	2 µl…5 µl ≤ 2%; > 5 µl…25µl ≤ 1%	3 µl…5 µl ≤ 2%; > 5 µl…60µl ≤ 1%
Tip types	10 µl (SW), 25 µl (SW), 60 µl (DW)	10 µl (SW), 25 µl (SW), 60 µl (DW)
Order No.	OL7001-26-216	OL7001-26-217

Table 1: Technical data of the CyBi®-SELMA family

Liquid Handling Performance Example Data generated with the ARTEL Multichannel Verification System (MVS®)

CyBio´s in house specification check and quality control is performed in the wet-to-wet reverse pipetting mode with a standardized absorption method (p-Nitrophenol as dye solved in 0.1 N NaOH), which is described in detail in the CyBi®-SELMA manual.

To confirm these data and to generate example data below the specification limit, the sophisticated and well accepted ARTEL Multichannel Verification System (MVS®) was used to evaluate the precision as well as the accuracy of the CyBi®-SELMA 384, 25 µl. For higher volumes (25 µl, 10 µl and 5 µl) the corresponding

MVS® Range Sample Solution was transferred in the standard pipetting mode (n=3).
For lower volumes (2.5 µl, 1 µl, 0,5 µl) the corresponding MVS® Stock / DMSO Solution was transferred in the reverse pipetting mode with an aspiration volume of 10 µl (n=2). The ARTEl MVS® analysis was performed as described in (1) and (2).

Results and Discussion

Table 2 summarizes the MVS® liquid handling performance data of the CyBi®-SELMA 384, 25 µl.

Target Volume [µl]	MVS® Stock Sample Solution	Relative Inaccuracy ± [%]	Precision error [CV in %]
25	Range A Standard	-0.08	0.84
10	Range A Standard	1.80	1.08
5	Range B Standard	2.94	1.13
2.5	Stock 1 / 90.2 % DMSO	-3.27	1.12
1	Stock 1 / 90.2 % DMSO	-2.70	2.16
0.5	Stock 1 / 75 % DMSO	11.0	1.08

Table 2: MVS® Example data for the evaluation of the liquid handling performance of the CyBi®-SELMA 384, 25 µl

The results indicate, that the CyBi®-SELMA 384, 25 µl allows highly precise and accurate liquid handling and they confirm CyBio´s inhouse specification data. Low volume transfers are often related to compound solutions in DMSO. Our example data show, that also in the low volume range below the specification limit a precise and accurate transfer of these liquids is possible with the CyBi®-SELMA 384, 25 µl.
It has to be pointed out that especially in the low volume range the pipetting performance considerably depends on the surface properties of the sample liquid.

References

1. Bradshaw, J. T.; Knaide, T.; Rogers, A.; Curtis, R. H.: Multichannel Verification System (MVS®): A Dual-Dye Ratiometric Photometry System for Performance Verification of Multichannel Liquid Delivery Devices. J. Assoc. Lab. Autom., 2005, 10, 35-42
2. Undisz, K.; Hanegraaff, I., Schork, S, Knaide, T.: Measuring the Precision and Accuracy of the CyBi®-Well vario 384/25 µl Head using the ARTEL Multichannel Verification System (MVS®), Technical Note, www.cybio-ag.com

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