

MVS[®] Specifications



SYSTEM PERFORMANCE

	Standard & Advanced Editions 96-Well Verification Plate	Advanced Edition Only 384-Well Verification Plate
Time Requirements	< 5 minutes	< 10 minutes
Tip Configurations	1, 2, 4, 6, 8, 12, and 96	1, 8, 12, 16, 24, 96, and 384
Traceable Volume Range	0.1000 - 350.0 μ L	0.0100 - 55.00 μ L
Operating Volume Range*	0.0001 - 350.0 μ L	0.0001 - 55.00 μ L
Artel 800TSNB Plate Reader		
Uncertainty (Inaccuracy)**	0.2000 - 350.0 μ L, \pm 2.0% 0.1000 - 0.1999 μ L, \pm 3.0%	0.0500 - 55.00 μ L, \pm 2.5% 0.0200 - 0.0499 μ L, \pm 3.5% 0.0100 - 0.0199 μ L, \pm 5.5%
Random Error (Imprecision)**	0.2000 - 350.0 μ L, \leq 0.4% 0.1000 - 0.1999 μ L, \leq 0.4%	0.0500 - 55.00 μ L, \leq 0.8% 0.0200 - 0.0499 μ L, \leq 0.8% 0.0100 - 0.0199 μ L, \leq 0.9%
Operating Temperature for Aqueous Sample Solutions	15 - 30 $^{\circ}$ C	15 - 30 $^{\circ}$ C
Operating Temperature for DMSO Sample Solutions	19 - 30 $^{\circ}$ C	19 - 30 $^{\circ}$ C
Traceability to national & international standards using Artel MVS Verification Plates	Yes	Yes

PERFORMANCE SPECIFICATION DEFINITIONS

- When each well in an MVS Verification Plate is uniformly¹ filled with a known² volume of MVS Sample Solution and measured with an Artel MVS Plate Reader, each individual well measurement will be within the stated MVS inaccuracy specification at a statistical confidence of 95% or better.³
- The CV across the full plate (96 or 384 individual results) will also be within the stated imprecision specification at a statistical confidence of 95% or better.⁴

1. When verifying the precision performance specification of the MVS, the liquid handler used to dispense into the MVS Verification Plates must be capable of repeatable volume delivery with a CV and tip-to-tip variability at least 3 times smaller than the MVS imprecision specification.
2. When verifying the accuracy performance specification of the MVS, the liquid handler used to dispense into the MVS Verification Plates must have a demonstrated accuracy (expanded uncertainty at k=2) at least 3 times smaller than the MVS accuracy specification.
3. The number of wells in a single plate, or in a collection of multiple plates, showing results outside of the MVS inaccuracy specification will be less than 5% of the total wells measured.
4. The probability that a plate dispensed in this way will show a CV greater than the imprecision specification is less than 5%, or one plate in 20.

* Measurement of volumes outside of the traceable volume ranges are not traceable to the national and international standards and no declarations of relative inaccuracy and imprecision are made.

** Stated specifications apply when Artel MVS Plate Readers MVS and MVS Verification Plates are used.

ARTEL 800TSNB PLATE READER

Size	Depth 41.9 cm, Width 38.1 cm, Height 17.8 cm
Weight	9.97 kg
Display	Touch screen
Light source	Tungsten gas filled bulb
Wavelength selection	Metal oxide interference filters Center wavelengths: 520.2 nm (bandwidth at half-max = 6.2 nm) 730.5 nm (bandwidth at half-max = 10 nm)
Additional filters	405 nm, 450 nm, 490 nm
USB COM port	USB

MVS TITER PLATE SHAKER

Dimensions	Length 142 mm, Width 99 mm, Height 48.2 mm
Amplitude	2.0 mm orbital
Shaking Speed Range	200 to 3000 rpm

MVS CALIBRATOR PLATE

Storage	15 - 25 °C in protective case, out of direct light
Recalibration	12 month factory recalibration required
Shelf life	1 year

MVS BAR CODE READER

Dimensions (LxWxH)	104 x 71 x 160 mm
Weight	147 g



MVS COMPUTER (minimum requirements)

x86 Processor	1.0 GHz
Memory	1 GB
I/O Ports	3 USB Connectors
Network	10/100 Ethernet and 802.11b Wireless
Storage	20 GB of hard drive space
Supported Operating Systems	Windows® 7 or Windows® 10

MVS MOBILE WORKSTATION

Weight	147 lbs.
Dimensions	Width 34 inches, Depth 20 inches, Height 40 inches
Accessories	Surge protector with 12 ft. cord

MVS DATA MANAGER SOFTWARE

- 21 CFR Part 11 compliance ready.
- Immediate display of pass/fail, dispense patterns via heat map, and volumetric results for each channel.
- Automatic flagging of all deliveries exceeding tolerance limits.
- Compatible with Microsoft Windows® 7 or Windows® 10.
- Easy exporting of data for analysis or viewing with other programs.
- Ability to re-evaluate data visually by modifying the pass/fail criteria after analysis.
- Test the performance of multiple liquid delivery devices using a single plate.
- Ability to use popular conventional microtiter plates when traceability is not a factor.
- Ability to verify and optimize a volume dispensing instrument using specific test solutions such as Dimethyl sulfoxide (DMSO).

MVS VERIFICATION PLATES

QTY per sleeve	25
Shelf Life	96-well: 60 months 384-well: 60 months
Material	Black, Polystyrene, optical bottom

MVS Volume Ranges	96 well standard profile plate	384 well for standard profile plate
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AQUEOUS SAMPLE SOLUTIONS		
Range HV Sample Solution	200.1 - 350.0 µL	N/A
Range A Sample Solution	50.00 - 200.0 µL	10.00 - 55.00 µL
Range B Sample Solution	10.00 - 49.99 µL	2.500 - 9.999 µL
Range C Sample Solution	2.000 - 9.999 µL	0.500 - 2.499 µL
Range D Sample Solution	1.000 - 1.999 µL	0.3000 - 0.4999 µL
Range E Sample Solution		
Traceable Volume Range	0.1000 - 0.9999 µL	0.0100 - 0.2999 µL
Non-traceable Volume Range	0.0001 - 0.0999 µL	0.0001 - 0.0099 µL
Stock Solution 1	0.4 - 9.9 µL	0.1 - 2.49 µL
Stock Solution 2	10 - 49.9 µL	2.5 - 9.9 µL
Shelf Life	24 months from date of manufacture.	
Storage/Operation	15 - 30 °C tightly capped, in closed box, out of direct light.	

DMSO SAMPLE SOLUTIONS		
DMSO Range C Solution	2.000 - 9.999 µL	0.500 - 2.499 µL
DMSO Range D Solution	1.000 - 1.999 µL	0.3000 - 0.4999 µL
DMSO Range E Sample Solution		
Traceable Volume Range	0.1000 - 0.9999 µL	0.0100 - 0.2999 µL
Non-traceable Volume Range	0.0001 - 0.0999 µL	0.0001 - 0.0099 µL
Shelf Life	24 months from date of manufacture.	
Storage	15 - 30 °C tightly capped, in closed box, out of direct light.	
Operation	19 - 30 °C	

PATENTS

The MVS system and its components are covered by patents listed at artel-usa.com/patents.