

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% 0.0001 - 0.0999 μ L, N/A	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% 0.0001 - 0.0099 μ L, N/A
Random Error (Imprecision)**	0.2000 - 350.0 μ L, \leq 0.4% 0.1000 - 0.1999 μ L, \leq 0.4% 0.0001 - 0.0999 μ L, N/A	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% 0.0001 - 0.0099 μ L, N/A
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

- 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.
- 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.
- 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.
- 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

Dimensions (DxWxH)	41.9 x 38.1 x 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
COM port	USB
Power requirements	Voltage: 90 - 260 VAC Frequency: 50 - 60 Hz Current: 2 A maximum

MVS TITER PLATE SHAKER

Dimensions (LxWxH)	142 x 99 x 48.2 mm
Amplitude	2.0 mm orbital
Shaking speed range	200 to 3000 rpm
Power requirements	External power supply - 100-240 V AC, 50-60 Hz

MVS CALIBRATOR PLATE

Storage	15 - 30 °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)

Processor	x64 Processor: 1.4 GHz or faster
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 (64-bit) or Windows® 10 (64-bit)

MVS MOBILE WORKSTATION

Weight	147 lbs.
Dimensions (DxWxH)	20 x 34 x 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.