

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 ELx800 NB[®] Plate Reader		
Relative 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%
Imprecision (%CV)*	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 to 30 $^{\circ}$ C	15 to 30 $^{\circ}$ C
Operating Temperature for DMSO Sample Solutions	19 to 30 $^{\circ}$ C	19 to 30 $^{\circ}$ C
Traceability to national & international standards using Artel 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 approved reader, each individual well measurement will be within the stated MVS inaccuracy specification at a statistical confidence of 95% or better³.
- 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 better⁴.

- When verifying the precision performance specification of the MVS, the liquid handler used to dispense into the 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 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.

*Stated specifications apply when Artel Plate Readers are used.

ARTEL ELx 800 PLATE READER

Size	Depth 42 cm, Width 38 cm, Height 18 cm
Weight	8 kg
Keypad	25 keys
Display	2 x 24 alphanumeric
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
Printer output	Parallel
COM port	USB

MVS TITER PLATE SHAKER

Dimensions	Length 144 mm, width 99 mm, height 48.2 mm
Amplitude	2.0 mm orbital
Shaking Speed Range	60 to 5000 rpm

MVS CALIBRATOR PLATE

Storage	15 to 30 °C in protective case, out of direct light
Recertification	Periodic factory recertification required
Shelf life	1 year

MVS BAR CODE READER

Power Requirements	Li-ion battery
Battery Life	Up to 50,000 scans per charge (approx. 14 hours)
Charging Time	Approx. 4.5 hours
Dimensions (LxWxH)	Scanner: 4.1 x 2.8 x 6.3" (104 x 71 x 160 mm) Base: 5.2 x 4.0 x 3.2" (132 x 102 x 81 mm)
Weight	Scanner: 7.5 oz (214 g) Base: 6.3 oz (179 g)

The HONEYWELL Xenon 1900 and Xenon 1902 are high-performance handheld 2D bar code scanners. They allow for easy recall of liquid handler devices and ease of use to enter required MVS bar code data into the Data Manager software.



MVS PORTABLE COMPUTER

Processor	1.0 GHz, minimum
Memory	128 MB, minimum
I/O Ports	3 USB Ports, minimum
Network	10/100 Ethernet and 802.11b Wireless
Storage	20 GB Hard Drive, minimum
Supported Operating Systems	Windows® 7 (32- or 64-bit) Windows® 8.1 (32- or 64-bit), or Windows® 10

MVS MOBILE WORKSTATION

Weight	232 lbs.
Length	48 inches (1.22 meters)
Accessories	Surge protector with 12 ft. cord

MVS DATA MANAGER SYSTEM SOFTWARE

Software Features

- 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 (32- or 64- bit), or Windows® 8.1 (32- or 64- bit), 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 SOLUTIONS

	Working volume for 96 well standard profile plate (µL)	Working volume for 384 well for standard profile plate (µL)	Working volume 384 round well standard profile low volume plate (µL)	Working volume for 384 low profile plate (µL)
Baseline Solution	200	55	28	20
Diluent Solution	200	55	28	20

AQUEOUS SAMPLE SOLUTIONS

Range HV Sample Solution	200.1 - 350.0	N/A	N/A	N/A
Range A Sample Solution	50.00 - 200.0	10.00 - 55.00	4.00 - 28.00	4.00 - 20.00
Range B Sample Solution	10.00 - 49.99	2.500 - 9.999	0.9500 - 3.999	0.9500 - 3.999
Range C Sample Solution	2.000 - 9.999	0.500 - 2.499	0.1900 - 0.9499	0.1900 - 0.9499
Range D Sample Solution				
Data Mgr 3.0 & higher	1.000 - 1.999	0.3000 - 0.4999	0.1500 - 0.1899	0.1500 - 0.1899
Data Mgr 2.4 & lower	0.500 - 1.999	0.1500 - 0.4999	0.0800 - 0.1899	0.0800 - 0.1899
Range E Sample Solution				
Data Mgr 3.0 & higher	Less than 1.0	Less than 0.3	Less than 0.15	Less than 0.15
Data Mgr 2.4 & lower	0.1000 to 0.4999	0.0300 - 0.1499	0.0190 - 0.0799	0.0100 - 0.0799
Stock Solution 1	0.4 - 9.9	0.1 - 2.49	0.05 - 1.49	0.04 - 1.49
Stock Solution 2	10 - 49.9	2.5 to 9.9	1.5 - 3.9	1.5 - 3.9
Shelf Life	24 months from date of manufacture.			
Storage/Operation	15 to 30 °C tightly capped, in closed box, out of direct light.			

DMSO SAMPLE SOLUTIONS

DMSO Range C Solution	2.000 - 9.999	0.500 - 2.499	0.1900 - 0.9499	0.1900 - 0.9499
DMSO Range D Solution	1.000 - 1.999	0.3000 - 0.4999	0.1500 - 0.1899	0.1500 - 0.1899
DMSO Range E Solution	Less than 1.0	Less than 0.3	Less than 0.15	Less than 0.15
Shelf Life	24 months from date of manufacture.			
Storage	15 to 30 °C tightly capped, in closed box, out of direct light.			
Operation	19 to 30 °C			

PATENTS

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