



## SYSTEM PERFORMANCE

	96 well MVS Verification Plate	384 well MVS 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 µL	0.0100 - 55.00 µL
Operating Volume Range*	0.0001 - 350.0 µL	0.0001 - 55.00 µL
Operating Temperature	15 - 30° C	15 - 30° C
Traceability to national & international standards using Artel MVS Verification	Yes	Yes

## Aqueous QualAssure

	96 well MVS Verification Plate			384 well MVS Verification Plate***		
	Solution Range (µL)	(Uncertainty) Inaccuracy (%)**	(Imprecision) CV (%)**	Solution Range (µL)	(Uncertainty) Inaccuracy (%)**	(Imprecision) CV (%)**
Aqueous HV	350.0 to 200.1	1.40 to 1.44	0.15 to 0.16	N/A	N/A	N/A
Aqueous A	200.0 to 50.00	1.36 to 1.58	0.16 to 0.19	55.00 to 10.00	1.87 to 2.08	0.36 to 0.39
Aqueous B	49.99 to 10.00	1.54 to 1.90	0.15 to 0.20	9.999 to 2.500	2.02 to 2.33	0.36 to 0.40
Aqueous C	9.999 to 2.000	1.46 to 1.63	0.15 to 0.20	2.499 to 0.500	2.04 to 2.35	0.36 to 0.40
Aqueous D	1.999 to 1.000	1.38 to 1.61	0.16 to 0.19	0.4999 to 0.3000	1.88 to 2.01	0.36 to 0.38
Aqueous E	0.9999 to 0.1000	1.39 to 2.87	0.16 to 0.22	0.2999 to 0.0300	1.89 to 3.23	0.36 to 0.44
	0.0999 to 0.0001 (Non-traceable volume range)	N/A	N/A	0.0299 to 0.0100	3.24 to 7.47	0.44 to 0.47
				0.0099 to 0.0001 (Non-traceable volume range)	N/A	N/A
Stock 1	0.4 to 9.9	N/A	N/A	0.1 to 2.49	N/A	N/A
Stock 2	10.0 to 49.99	N/A	N/A	2.5 to 9.9	N/A	N/A
Shelf Life	24 months from date of manufacture.					
Storage/Operation	15 - 30 °C tightly capped, in closed box, out of direct light. <i>For additional details regarding storage/operation outside these conditions, see the MVS User Guide.</i>					

## DMSO QualAssure

96 well MVS Verification Plate

384 well MVS Verification Plate\*\*\*

	Solution Range ( $\mu\text{L}$ )	(Uncertainty) Inaccuracy (%)**	(Imprecision) CV (%)**	Solution Range ( $\mu\text{L}$ )	(Uncertainty) Inaccuracy (%)**	(Imprecision) CV (%)**
DMSO C	9.999 to 2.000	1.46 to 1.63	0.15 to 0.20	2.499 to 0.500	2.04 to 2.35	0.36 to 0.40
DMSO D	1.999 to 1.000	1.38 to 1.61	0.16 to 0.19	0.4999 to 0.3000	1.88 to 2.01	0.36 to 0.38
DMSO E	0.9999 to 0.1000	1.39 to 2.87	0.16 to 0.22	0.2999 to 0.0300	1.89 to 3.23	0.36 to 0.44
	0.0999 to 0.0001 (Non-traceable volume range)	N/A	N/A	0.0299 to 0.0100	3.24 to 7.47	0.44 to 0.47
				0.0099 to 0.0001 (Non-traceable volume range)	N/A	N/A
Shelf Life	24 months from date of manufacture.					
Storage/Operation	19 - 30 °C tightly capped, in closed box, out of direct light. <i>For additional details regarding storage/operation outside these conditions, see the MVS User Guide.</i>					

## PCRMix QualAssure

96 well MVS Verification Plate

384 well MVS Verification Plate\*\*\*

	Solution Range ( $\mu\text{L}$ )	(Uncertainty) Inaccuracy (%)**	(Imprecision) CV (%)**	Solution Range ( $\mu\text{L}$ )	(Uncertainty) Inaccuracy (%)**	(Imprecision) CV (%)**
PCRMix B	49.99 to 10.00	1.54 to 1.90	0.15 to 0.20	N/A	N/A	N/A
PCRMix C	9.999 to 2.000	1.46 to 1.63	0.15 to 0.20	N/A	N/A	N/A
Shelf Life	24 months from date of manufacture.					
Storage/Operation	2 - 25 °C tightly capped, in closed box, out of direct light. <i>For additional details regarding storage/operation outside these conditions, see the MVS User Guide.</i>					

## SerumSub QualAssure and PlasProxy QualAssure

96 well MVS Verification Plate

384 well MVS Verification Plate\*\*\*

	Solution Range ( $\mu\text{L}$ )	(Uncertainty) Inaccuracy (%)**	(Imprecision) CV (%)**	Solution Range ( $\mu\text{L}$ )	(Uncertainty) Inaccuracy (%)**	(Imprecision) CV (%)**
SerumSub A	200.0 to 50.00	3.01 to 3.16	0.16 to 0.19	N/A	N/A	N/A
SerumSub B	49.99 to 10.00	3.00 to 3.16	0.15 to 0.20	N/A	N/A	N/A
PlasProxy A	200.0 to 50.00	3.01 to 3.16	0.16 to 0.19	N/A	N/A	N/A
PlasProxy B	49.99 to 10.00	3.00 to 3.16	0.15 to 0.20	N/A	N/A	N/A
Shelf Life	12 months from date of manufacture.					
Storage/Operation	2 - 8 °C tightly capped, in closed box, out of direct light. <i>For additional details regarding storage/operation outside these conditions, see the MVS User Guide.</i>					

## PERFORMANCE SPECIFICATION DEFINITIONS

- When each well in an MVS Verification Plate is uniformly<sup>1</sup> filled with a known<sup>2</sup> volume of MVS QualAssure 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.<sup>3</sup>
- 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.<sup>4</sup>

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 (ELx800 and 800TSNB) and MVS Verification Plates are used with QualAssure solutions.

\*\*\* Requires 384-Well Plate Support add-on activation code.

## 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 Temperature	15 - 25 °C in protective case, out of direct light
Operation Temperature	15 - 30 °C
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: 2.4 GHz (recommended 4 or more cores)
Memory	8 GB (recommended min. 16GB)
I/O Ports	3 USB Connectors
Network	Gigabit Ethernet or 802.11n wifi
Storage	40 GB of hard drive space
Supported Operating Systems	Windows® 10 or Windows® 11
SQL Server	2019, 2017, 2016, and 2014 in Express, Standard, and Enterprise Editions

## MVS WITH ARTELWARE

- 21 CFR Part 11 compliance ready.
- Immediate display of pass/fail, and volumetric results for each channel.
- Automatic flagging of all deliveries exceeding tolerance limits.
- Ability to schedule verifications and send email notifications.
- Provides comprehensive reporting, including audit trail and printing of verification labels.
- Easy exporting of data for analysis or viewing with other programs.
- 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 QualAssure test solutions such as DMSO, PCRMix, SerumSub and PlasProxy.
- Compatible with Microsoft Windows® 10 or Windows® 11.

[artel.co/MVS](http://artel.co/MVS)

### PATENTS

The MVS system and its components are covered by patents listed at [artel.co/patents](http://artel.co/patents).