



# Smart Mini Syringe Pump SMSP<sub>1</sub>

precision, accuracy and reliability you can count on.

+++ precise +++ accurate +++ reliable +++ efficient +++ miniaturized +++ modular +++ flexible +++

## Features

- Wide Speed Range 1:20000 (e.g. 0.05...1000  $\mu$ l/s)
- Various Syringe Volume Options 0.5 ml...100 ml
- Volumetric Error < 0,5% (of Full Syringe Range)
- Volumetric Reproducibility < 0,1% (of Full Syringe Range)
- Smooth, Pulsation-Free and Oscillation-Free Dispensing (<0.05% of Full Syringe Range)
- Miniaturized and Weight Optimized Design (down to 250 g with 2 ml syringe)
- Integrated Microcontroller and Motor Control
- Smooth, 1/256 Micro Stepping Control
- Various Control and Interfacing Capabilities:
  - USB (via adapter)
  - UART (RS232)
  - pulse frequency/direction input
  - flexible digital/analog expansion interface for retrofit options\*
- Optimized Service/Maintenance
- Extended Lifetime (MTBF), typ.:  
Syringe (no leakage): 2 years@500 cycles/day typ.  
Pump/Mechanics: 5 years@500 cycles/day typ.

## Smart Self Monitoring Options

- Status Monitor (LED)
- Acoustic status/configuration and fault indicator
- Movement Precision Monitoring
- Motor Overload Monitor (Current/Temperature\* )
- Pressure Monitor\*
- Performance Memory / Error Counter
- Fault Prediction / Aging Monitor
- Acoustic Fault Signaling
- All Parameters accessible via UART (or USB)

## Smart Extension Options\*

- Valves (up to 3), including bipolar pulse control
- Syringe Pump Cascading (e.g. 2 pumps tandem or parallel)

## Applications

- High Precision/Accuracy Volumetric Dispensing
- OEM Applications
- High Precision Volumetric Flow Cytometry (FCM, MSA, MSFA)
- Loop Type Sample/Reagent Fluidics Support
- High Throughput Sample Automation (e.g. pocketSPU)
- Retrofit for QA FCM Syringe Pumps

\*) optional

## Technical Specifications

Feature	Unit	Variant- Full Range			
		SMSP1-1000	SMSP1-1500	SMSP1-10K	SMSP1-100K
Max. Dispension Volume/Cycle (Full Range Syringe Volume), FR	ml	1.0	1.5	10	100
Dimensions	mm	150 x 40 x 40	150 x 40 x 40	tbd	tbd
Weight (including syringe)	g	470	470	tbd	tbd
Volumetric Dispensing Rate (min)	µl/s	0.05	0.1	1	10
Volumetric Dispensing Rate (max)	µl/s	1,000	1,500	10,000	100,000
Volume Accuracy	% FR	<0.5	<0.5	tbd	tbd
Volume Reproducibility (similar cycle)	% FR	<0.1	<0.1	tbd	tbd
Volume Rate Pulsation	µl	<0.1	<0.1	tbd	tbd
Volume Rate Oscillation	% FR	<0.05	<0.05	tbd	tbd
Max. syringe pressure	hPa	2,000	2,000	1,000	500
Power Supply	V	12	12	12	12
Max Current Consumption (typ.) *2)	A	0.6	0.6	1	2
Reposition Time (min)	s	1	1	tbd	tbd
Life Time (MTBF), Pump Mechanics, typ. *1)	cycles	500,000	500,000	tbd	tbd
Life Time (MTBF), Syringe, typ. *1)	cycles	200,000	200,000	tbd	tbd
Media	-	water, air	water, air	water, air	water, air
Compact Size	Standards: manufactured according to ISO 9001:2015, RoHS				

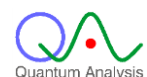
- 1) full range cycles (@50% of max. dispensing rate)
- 2) depending on extension options

Note: All specifications verified for water or aqueous solutions with similar properties

## Order Information

Article No. Config. Code	Option
09-4000	SMSP1-1000 Smart Mini Syringe Pump 1000 µl
	SMSP1-1500 Smart Mini Syringe Pump 1500 µl

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