

GIN EMB™ Dispensing Pump

GIN EMB™ pumps are extremely accurate and maintenance free liquid handling devices for sub microliter dispensing. The patented Electro Magnetic Bellows (EMB) technology can handle all reagents including cells and beads. All GIN EMB™ pumps are non-contact dispensing devices. They provide automatic tip clot detection based on a fluid path integrated pressure sensor.

GIN EMB™ pumps come in two different configurations that are differentiated only by the size of the bellows.

GIN EMB™ 150 can handle fluid aliquots from 50 nanoliters to 140 microliters with 1 nanoliter resolution and CVs that are under 1%.

GIN EMB™ 50 is made to aspirate and dispense fluid aliquots from 10 nanoliters to 45 microliters with similar system performance parameters to GIN EMB™ 150.

Firmware

Programmable aspiration / dispensing speeds, programmable overshoot, delays and loops, programmable HW triggering and handshake, diagnostics, dispensing commands in volume units, clot (blockage) detection, pressure measurement during aspiration / dispensing, syringe emulation mode, save parameters in flash memory.

Safety and Regulatory Compliance

GIN EMB-modules are manufactured in Finland in a manufacturing facility with ISO 9001:2008 and ISO 14001:2004 compliant quality systems certified by Det Norske Veritas Inc. (DNV) and the manufacturing facility complies with QSR.



GIN EMB™ Dispensing Pump

Technology

- Electromagnetic Bellows technology (EMB-technology), a metallic bellows driven by an electromagnetic actuator
- Maintenance free operation, integrated pressure sensor for qualitative feedback

Valve

- 2-functions: input and output
- Turn Time ≤ 250 ms between adjacent ports

Drive

- Stepper motor with optical encoder for positioning feedback

Materials

- Plug: Teflon (PTFE) ; Body: Kel-F (PCTFE)
- Fully plastic, bellows is coated with parylene, bellows housing is made out of PEEK

Fittings

- M6 tubing

Dimensions

- Height: 127 mm ; Width: 44.5 mm; Depth: 148.5 mm

Power Requirements

- 24 VDC $\pm 10\%$ with peak current of 1.5 Amps

Resolution

- 1.0 nanoliters

Aspiration /Dispensing rate

- Maximum dispensing / aspiration pressure pulse rate 65 ml / sec (theoretical)
- Minimum dispensing / aspiration pressure pulse rate 1 μ l / sec depending upon tubing and dispensing tip size

Dosing speed

- Maximum speed 40 doses / sec depending upon dose size and dispensing tip

Interface

- RS-232, RS-485, Baud Rate for RS-232 or RS-485: 9600 or 38400
- RS-232 or RS-485: Data Bits: 8 ; Parity: None; Stop Bit: 1; Half Duplex

Addressing

- Up to 15 pumps can be addressed individually

Communications

- Data terminal and OEM protocol

Environmental requirements

- 15° - 40°C (59° - 104°F): Operating temperature
- 20-80% RH at 40°C (104°F), non-condensing

Patent US 7.316.336; FI 110031

EMB 50

Range

- Minimum stroke (aspirate or dispense) : 10 nanoliters
- Maximum stroke (aspirate or dispense) : 45 microliters

Precision

- $\leq 1.0\%$ CV over 250 nanoliters using purified DI water
- $\leq 2.0\%$ CV over 100 nanoliters and below 250 nanoliters using purified DI water
- $\leq 20.0\%$ CV over 50 nanoliters and below 100 nanoliters using purified DI water

Accuracy

- $< 0.5\%$ deviation from expected at any point over 250 nanoliters
- $< 1.0\%$ deviation from expected at any point over 100 nanoliters and below 250 nl.
- $< 10.0\%$ deviation from expected at any point over 50 nanoliters and below 100 nl.

EMB 150

Range

- Minimum stroke (aspirate or dispense) : 50 nanoliters
- Maximum stroke (aspirate or dispense) : 140 microlitres

Precision

- $\leq 1.0\%$ CV over 500 nanoliters using purified DI water
- $\leq 2.0\%$ CV over 200 nanoliters and below 500 nanoliters using purified DI water

Accuracy

- $< 0.5\%$ deviation from expected at any point over 500 nanoliters
- $< 1.0\%$ deviation from expected at any point over 200 nanoliters and below 500 nl.