



## Dual Resolution Syringe model DRS 20/300 for Hamilton PSD4 type drive

### CONCEPT by Spec sheet [DRD PN 81324-212-20/300]

Total height is 2.75" at the top compressed Home position, 3.25 at the resolution mode transition level (shown in photo) and 3.62" at the full extended bottom aspiration position. The resolution Multiplier is 25, corresponding to having resolution like a 100 uL syringe in the Differential mode and resolution/flow like a 2.5 mL syringe in the Single mode. The Hamilton PSD/4 drive has microstep mode resolution of 0.0000492"/microstep (subsequently referred to just as "steps"). Full excursion uses 17000 steps and 250 microsteps backlash correction is recommended.

**Motor drive resolution and speed** are the same throughout for both the Differential and Single displacement modes.

0.0000492 inches per step

Slowest speed is 0.002 "/sec obtained from 41 steps/sec

Fastest speed is 1.14 "/sec obtained from 23,200 steps/sec

**Differential Displacement:** resolution is same as 100 uL syringe

9,500 steps (steps 0 - 9,500)

0.47 inches

42.4 uL/inch

2.08 nanoliters/step

Maximum volume 19.8 uL

Flow range 0.08 uL/sec min to 48.3 uL/sec max

**Separation level** (mode transition) is 10,400 steps = 0.50" down from Home.

**No-Man's land** is 1,798 steps (steps 9,501-11,299) = 0.089"

**Single Displacement:** resolution/flow same as a 2.5 mL syringe

5,700 steps (11,300 - 17,000)

0.28 inches

1,058.4 uL/inch

0.05208 uL/step

Maximum volume 297 uL

Flow range 2.12 uL/sec min to 1208.4 uL/sec max

**Total steps** used is 17,000 for 0.84 " total excursion

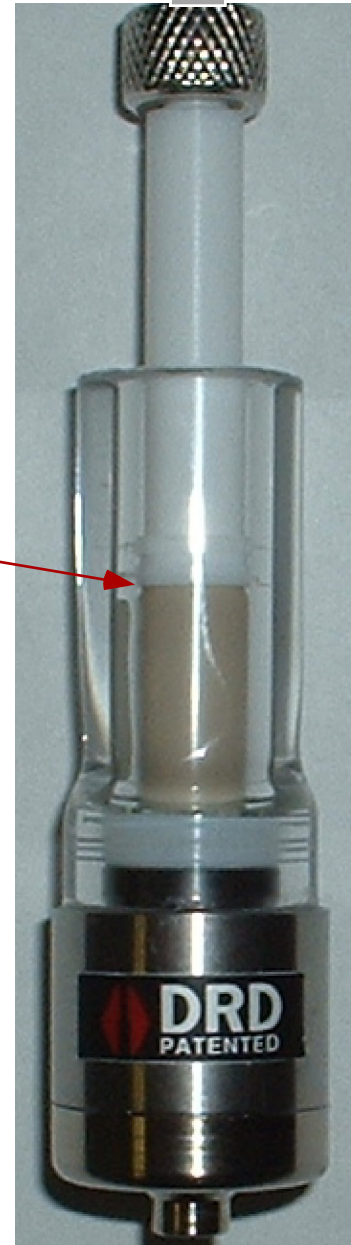
**Blastoff** tip escape velocity through 0.012" ID probe tip is

4 meters/sec at standard default speed (0.3 in/sec)

and 16 m/sec at max speed (1.14 "/sec). With 0.016" ID

probe tip, escape velocity is 2.3 m/sec at standard and

9 m/sec at max speed.



Mode Transition Level  
scale 200%