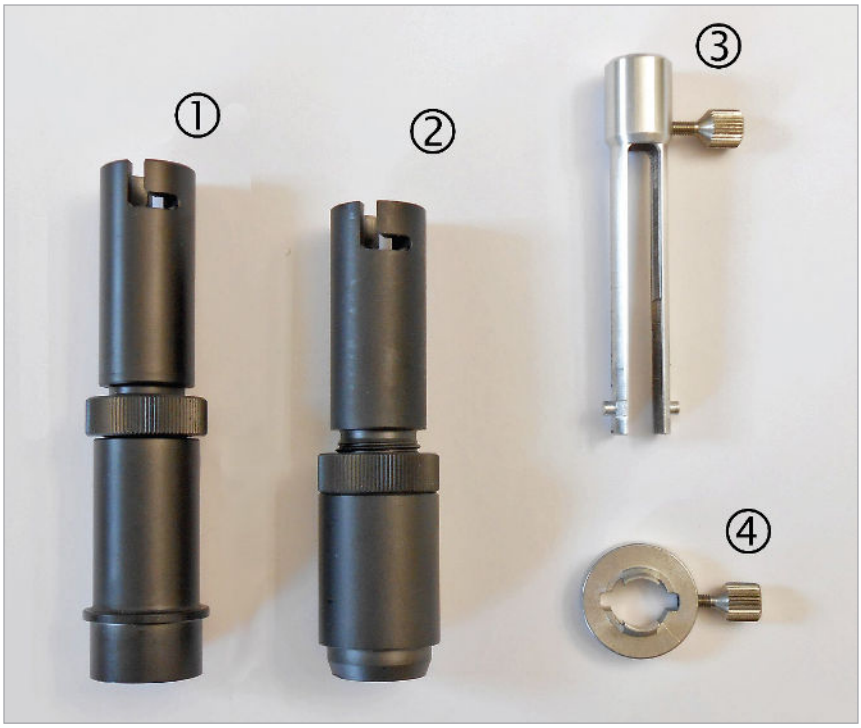
PAL Smart SPME Manual Injection Kit

cat.# 28912 (for use Smart SPME Arrows and fibers)

1.0 Kit Description

Figure 1: Parts Included in the PAL Smart SPME Manual Injection Kit



1	Manual Smart SPME Extraction Guide
2	Manual Smart SPME Injection Guide
3	Manual Smart SPME Arrow Holder
4	Locking screw

Note: The Manual Smart SPME Arrow Injection Kit can only be used with Smart SPME Arrows—it cannot be used with "non-smart" SPME Arrows.

Note: The Smart SPME Arrows and the GC-specific adaptor kit are sold separately.

2.0 Inserting a SPME Arrow or SPME fiber into the Manual SPME Arrow Holder

1. Loosen the locking screw **(4)** and remove it from the holder **(3)** (Figure 2).
2. Carefully slide the Smart SPME Arrow **(5)** into the holder as far as it will go (Figure 2).
3. Lock the head of the Smart SPME Arrow in place by tightening the screw on top of the holder **(6)** (Figure 2).
4. Slide the locking screw **(4)** from below over the holder. The two lugs have to point upwards (Figure 3).
5. Tighten the screw loosely—it will be adjusted in the next steps.

Note: The locking screw restricts the maximum exposure of the Smart SPME Arrow.

Figure 2: Inserting a Smart SPME Arrow into the Manual Smart SPME Arrow Holder

Figure 3: Slide the locking screw over the Arrow and onto the holder in the direction shown below.

Figure 4: The Smart SPME Arrow Inserted and Fixed in the Manual Smart SPME Arrow Holder

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3.0 Adjust Minimum and Maximum Penetration Depth Using the Manual SPME Extraction Guide

The Manual SPME Extraction Guide comes with two adjustable guides—one for extraction and one for injection. The Smart SPME Arrow holder is inserted into a milled groove and locked by slightly turning it **(1)** (Figure 5). The penetration depth can be decreased by unscrewing the lower part of each guide counterclockwise **(2)** and countering it with the fastening ring **(3)** (Figure 6). Choose the corresponding penetration depth for extraction and injection according to your application (Figure 6).

For an adjustment of the minimum penetration depth and the extraction penetration depth for headspace extraction, follow the description in section **4.0**. For an adjustment of the minimum penetration depth, and the extraction penetration depth for immersion extraction follow the description in section **5.0**.

4.0 Adjust Penetration Depth for Headspace Extraction Using the Manual SPME Extraction Guide

4.1 Adjust Minimum Penetration Depth for Headspace Extraction

1. Insert the holder with the Smart SPME Arrow into the milled grove of the Manual SPME Extraction Guide and turn it slightly to lock it (Figure 7).
2. Screw out the lower part of the guide **(1)** counterclockwise (Figure 7) and adjust the tip of the SPME arrow with protected SPME Arrow in a way that it protrudes 10 mm on the bottom of the Manual SPME Extraction Guide (see figure 8).
3. Counter the lower part of the guide with the fastening ring **(2)** (Figure 7).

4.2 Adjust Extraction Penetration Depth for Headspace Extraction

1. Loosen the locking screw **(4)** (Figure 9).
2. Determine the optimum penetration depth directly in a vial by penetrating and moving the plastic part **(5)** (Figure 9) of the Smart SPME Arrow to expose the Arrow (Figure 10).
3. Alternatively (if you already know the ideal value), measure and adjust the optimum penetration depth for extraction without using a vial (Figure 11).
4. Once the optimum penetration depth is adjusted, move the locking screw up to the protruding part of the plastic part **(5)** (Figure 9) and tighten it—it will work as stopper, limiting the exposure of the SPME Arrow.

Figure 5: Milled Groove for Entering the Holder

Figure 6: Adapting the Penetration Depth

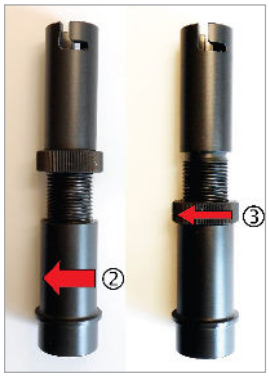


Figure 7: Manual Holder Locked in Manual SPME Extraction Guide.

Figure 8: Measure 10 mm.

Figure 9: Loosen the upper locking screw.

Figure 10: Determine the optimum penetration depth directly in a vial.

Figure 11: Alternatively measure the optimum penetration depth for extraction.

5.0 Adjust Penetration Depth for Immersion Extraction Using the Manual Smart SPME Extraction Guide

Since it is advised that the Smart SPME Arrow is completely exposed for immersion extraction, there is no need to restrict the maximum exposure of the Smart SPME Arrow. Therefore, the locking screw can be placed on the lowest possible position while the Smart SPME Arrow is completely exposed.

For the adjustment of the penetration depth for immersion extraction, the lower part of the guide can be screwed in completely (Figure 5).

1. Insert the Manual Smart SPME Arrow Holder with protected Arrow into the milled groove of the Manual Smart SPME Extraction Guide. (The guide should be as short as possible.)
2. Penetrate a vial with the protected Smart SPME Arrow and fully expose the SPME Arrow within the vial (by moving the plastic part of the Smart SPME Arrow completely down) (Figure 12).
3. Loosen the locking screw and adapt the penetration depth of the exposed Arrow to the ideal position.
4. Note: If the ideal penetration depth is known, it is not necessary to use a vial for adjustment—instead it is also possible to set the penetration depth to a measured value (Figure 13).
5. Tighten the locking screw.

6.0 Adjust Injector Penetration Depth Using the Manual SPME Injection Guide

The ideal penetration depth for the GC injector is adjusted using the Manual SPME Injection Guide **(11)**. The GC-specific injector adapter **(12)** is needed for the measurement.

Note: The GC-specific injector adapter is not part of delivery of this kit, but part of delivery of the GC Mounting Kit (PAL3 or PAL-*xt*).

1. Insert the holder into the Manual SPME Injection Guide and lock it.
2. Place the injector adapter for the GC on the Manual SPME Injection Guide and measure the maximum penetration depth with fully exposed SPME Arrow. Measuring is done from the lower groove of the adaptor (Figure 15).
3. Reduce the penetration depth by screwing the lower part of the Manual SPME Injection Guide down counter-clockwise (Figure 17, top).
4. Lock the position of the Manual SPME Injection Guide using the locknut (Figure 17, bottom).

Figure 12: Penetrating a Vial and Exposing the SPME Arrow

Figure 13: Setting the Optimum Penetration Depth Directly to a Measured Value

Figure 14: Maximum adjustable penetration depth of 70 mm

Figure 15: Measuring from the Lower Groove of the Adaptor

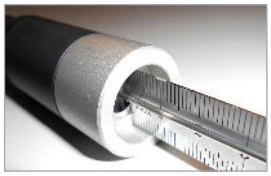
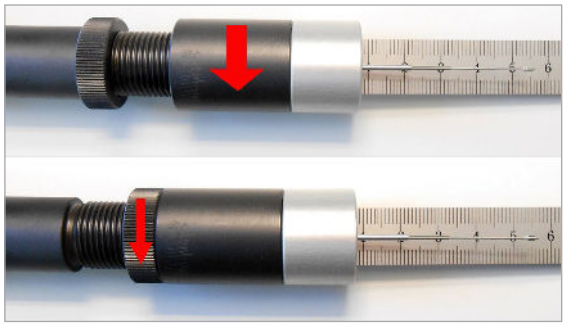


Figure 16: The Manual SPME Injection Guide with the GC-Specific Injector Adaptor

Figure 17: Adapting the Penetration Depth with the Manual SPME Injection Guide



Now the Manual SPME Arrow Holder is ready for use.

A typical workflow would be as follows:

1. Insert a vial into the agitator module and wait for the incubation time.
2. Penetrate the vial with the protected SPME Arrow.
3. Push the black part of the holder down—the SPME Arrow will be exposed.
4. Extract for the prescribed length of time.
5. Pull back the black part of the holder—the SPME Arrow will be protected.
6. Depenetrate the vial.
7. Insert the holder into the Manual SPME Injection Guide.
8. Put the Manual SPME Injection Guide with the holder onto the GC-injector with the mounted type-specific adapter.
9. Push the black part of the holder down—the SPME Arrow will be exposed.
10. After a certain wait time, start the GC.
11. Desorb completely.
12. Pull back the black part of the holder—the SPME Arrow will be protected.
13. Depenetrate the injector.

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