



testo smoke pump

Instruction manual

TÜV approved





Please read the instruction manual carefully prior to using the instrument and keep it nearby for reference purposes.

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1. General information

The **testo smoke pump** is TÜV approved and corresponds to DIN 51402 as well as ASTM D 2156.

It stands out on account of its robust design, guaranteeing a long life.

2. Intended use

The **testo smoke pump** is used to determine the smoke number in oil burners.

3. Basic safety information



Measuring correctly:

- ▶ The **testo smoke pump** should be heated to room temperature prior to use.
- ▶ Check the sampling probe and connection hose for soot deposits after every 10 measurements and clean these and the other parts of the flue gas pump regularly (See 5.1 Cleaning smoke pump).
- ▶ Check the **testo smoke pump** for leaks from time to time (See 5.3 Checking for leaks).
- ▶ Keep the smoke number scale clean.



Warranty conditions:

- ▶ The **testo smoke pump** should be handled with care.
- ▶ Never use force.

4. Operation

4.1 Taking flue gas sample

The burner should be left burning for at least 5 minutes before taking a sample!



- 1 Place filter paper strip in the pump head slot and clamp in position by turning the knurled screw to the right.



- 2 Place the probe through the opening in the flue gas pipe and position in the centre of the flue gas flow.



If the plunger is moving sluggishly, regrease smoke pump (See 5.2 Regreasing smoke pump)!

- 3 10 complete intake strokes should be carried out: the pump plunger is pulled back to the limit within 3 seconds.
 - 1.63+/-0.07dm³ flue gas is taken in by the filter paper, corresponding to stipulations.
 - 4 Release knurled screw by turning it to the left and remove filter paper strip.
 - A black spot remains on the filter strip.
- At least 3 samples must be taken to determine the smoke number of a system! The smoke number of the system is then calculated (See 4.2 Determining the smoke number).

4.2 Determining the smoke number

- 1 Check spot for oil derivate: Pour drops of solvent right next to the spot.
 - If colour is not grey, the sample is ok.

-or-

- Grey colour spreads to spot which means that there is oil in the flue gas!
Check oil burner!



- 2 Hold spot from filter paper strip behind the grey of the smoke number scale and read off the smoke number.

- The grey value, closest to the colour of the spot, indicates the smoke number.
- 3 The arithmetic mean of the smoke numbers are calculated from all of the samples. The value is rounded up.
- This value is the smoke number of the system.

5. Maintenance

5.1 Cleaning the smoke pump

Removing slightly adhesive soot particles:

- ▶ With a slightly tightened knurled screw and without filter paper, let the pump run through a few quick strokes.

Dismantling the smoke pump:

- 1 Screw off the cylinder cover plate by turning it to the left.

 Do not damage the collar on the thread of the cylinder inner wall!

- 2 Carefully remove plunger from the cylinder.

 Do not remove collar from plunger rod to clean.

- 3 Unscrew probe head by turning it to the left.
- 4 Unscrew valve to the left using the enclosed key.

Removing lubricant residue:

 Only use cleaning agents which do not attack plastic!

- ▶ Clean plunger rod using fine sand paper.
- ▶ Clean cylinder wall, collar and other parts using a damp cloth or suitable brush.

5.2 Regreasing smoke pump

 Clean all parts of the smoke pump before regreasing (See 5.1 Cleaning smoke pump)!

 Only testo lubricating oil (0554.0304) should be used to grease the pump!
Do not apply too much lubricating oil

- 1 Apply lubricating oil to collar and place a layer of non-linting textile over it, through which the oil can soak.
- 2 Move plunger up and down in cylinder so that an even film is applied to the cylinder wall.
- 3 Any oil remaining in the textile can be distributed via the collar edge.
- 4 Put smoke pump back together again.

5.3 Checking for leaks

- 1 Place a piece of cardboard, with the thickness of two postcards, in the slot in front of the cylinder output and keep it in position by twisting the knurled screw to the right.
- 2 Using handle, pull pump plunger out by approx. 3cm and then release.
 - The handle returns to its original position: pump is not leaking.

-or-

- Handle does not return to its original position: Pump is leaking.
Possible causes: Rubber hose defect (See 5.4 Checking rubber hose).

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Plunger collar or back valve are not sealed properly (See 5.5 Checking plunger collar and back valve).

5.4 Checking rubber hose

- 1 Twist off spiral protection spring.
- 2 Inspect rubber hose.
- 3 Change rubber hose if necessary.

5.5 Checking plunger collar and back valve

- 1 Remove cylinder cover plate by twisting it to the left.



Do not damage collar on thread of cylinder inner wall.

- 2 Slowly pull out plunger until the end of the cylinder is reached.
 - Plunger collar shows clear signs of wear and tear or damage: change collar (See Chapter 5.5 Changing the plunger collar)

-or-

- Plunger collar does not show any or little wear:
 - ▶ Regrease smoke pump to ensure it is sealed (See 5.2 Regreasing smoke pump).
- 3 Recheck smoke pump for leaks (See 5.3 Checking for leaks).

If the smoke pump is not yet properly sealed, the back valve is probably defect.

- ▶ Unscrew valve by turning it to the left using the enclosed key and replace with new valve.

5.6 Changing plunger collar

- 1 Cut old collar with a knife and remove from the plunger rod.
- 2 Place new collar on a solid surface.
- 3 Press the plunger rod (side with indent) in the collar opening.

- 4 Check if the rubber part is locked into place in the indent.
- 5 Apply lubricating oil to collar.
- 6 Put smoke pump back together again.

5.7 Changing valve and valve fitting

- 1 Unscrew the old valve with the valve spanner included. Remove the inserted flat gasket.
- 2 Screw in new valve and new gasket with the valve spanner until the parts cannot be turned further without the use of force.
- 3 Screw the valve tight with an eighth to a quarter of a turn. The gasket seals the valve.



If the valve is screwed in too far or too tight, the valve fitting will be destroyed.

6. Spare parts

Valve set consisting of clamping part and valve	0554.0412
Plunger collar	0135.0116
Sampling probe	0180.0135
Probe holder	0135.0115
Protective spring	0130.0019
Probe hose	0086.1000

7. Accessories

Smoke pump set	0554.0307
(Barcode no. EAN 4029547000386)	
Filter paper	0554.0308
Smoke scale	0554.0309
Lubricating oil	0554.0304

8. Warranty

2 years