

# Operating Manual

Frost protection tester (item no. 00 2002 0645) for Vaillant solar fluid

## 1 General information

### 1.1 Notes on the documentation

The following notes are intended to help you throughout the entire documentation.

Further documents apply in combination with this operating manual.

**We accept no liability for any damage caused by failure to observe this manual.**

### 1.2 Applicable documents

Observe all manuals for components of the system when using the frost protection tester. These manuals are supplied with the respective system components and auxiliary components.

### 1.3 Storage of the documents

Store the operating manual always together with the frost protection tester.

### 1.4 Symbols used

Observe the safety instructions in this operating manual when using the frost protection tester.

The symbols used in the manual are explained below:



**Danger!**  
Immediate risk of serious injury or death!



**Danger!**  
Risk of burns or scalding!



**Caution!**  
Potentially dangerous situation for the product and environment!



**Note!**  
Useful information and instructions

- Symbol for a necessary task

### 1.5 Intended use

The frost protection tester is intended only for checking the frost and corrosion protection of Vaillant solar fluid. Intended use includes the observance of the operating manual.



**Caution!**  
Any improper use is forbidden.

## 2 Safety instructions



**Danger!**  
Risk of being scalded by hot solar fluid!  
Check the temperature on the thermometer of the solar circuit. Only draw off solar fluid if its temperature is below 50 °C!



**Danger!**  
Irritation of the eyes and skin by solar fluid!  
Avoid contact of the eyes and skin with solar fluid by wearing safety glasses and rubber or PVC gloves. Observe the safety data sheet in the system description and the notes on the packaging of the solar fluid.



**Danger!**  
Irritation of the eyes by solar fluid!  
If your eyes come in contact with solar fluid, wash them thoroughly under running water for 15 minutes with your eyes wide open.



**Caution!**  
Risk of damage to the areometer due to the glass breaking!  
The areometer is very fragile. Look after it carefully and pack it in the original packaging immediately after use.



**Caution!**  
Risk of damage to the thermometer due to excess heat!  
Use the thermometer only for measurements of temperatures up to a maximum of 50 °C.

### 3 Scope of delivery

- Check the delivery for completeness before using the frost protection tester for the first time.

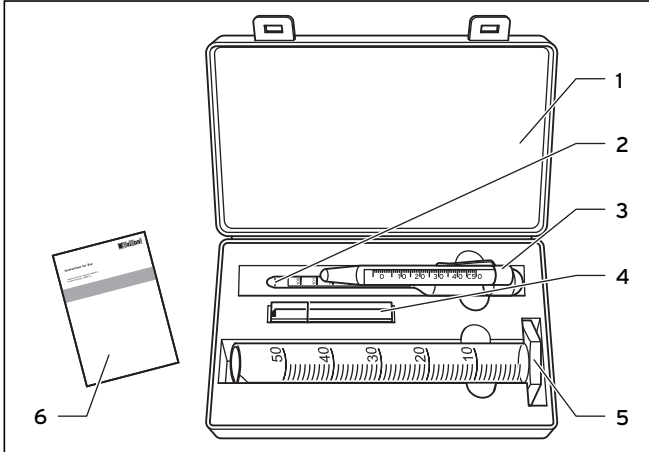


Fig. 3.1 Scope of delivery of the frost protection tester

#### Key

- 1 Transport case
- 2 Areometer
- 3 Thermometer
- 4 pH indicator rods
- 5 Standing cylinder
- 6 Operating manual

### 4 Operation

To protect the solar system securely from frost and corrosion, you must fill the entire system with undiluted Vaillant solar fluid.

You must check the solar fluid with the Vaillant frost protection tester if the frost and corrosion protection level of the solar fluid is reduced due to ageing or impermissible dilution. Check the solar fluid after filling the system and then once a year.



#### Caution!

**Risk of damage to the collectors or other system parts!**  
Do not mix the Vaillant solar fluid with water or other fluids.



#### Note!

The colour of the solar fluid may turn yellowy-brown or fade after several years of operation.



#### Caution!

Only use the original Vaillant frost protection tester (item no. 00 2002 0645). Otherwise the indicated density may be incorrect.

#### 4.1 Checking the frost protection of the solar fluid



#### Danger!

**Risk of being scalded by hot solar fluid!**

Check the temperature on the thermometer of the solar pump unit. Only draw off solar fluid if its temperature is below 50 °C!



#### Danger!

**Irritation of the eyes and skin by solar fluid!**  
Avoid contact of the eyes and skin with solar fluid by wearing safety glasses and rubber or PVC gloves. Observe the safety data sheet in the system description and the notes on the packaging of the solar fluid.



#### Danger!

**Irritation of the eyes by solar fluid!**

If your eyes come in contact with solar fluid, wash them thoroughly under running water for 15 minutes with your eyes wide open.

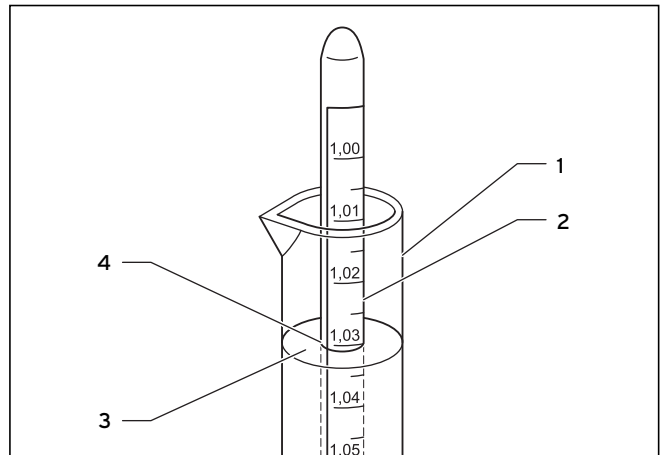


Fig. 4.1 Viewing the density

#### Key

- 1 Standing cylinder
- 2 Areometer
- 3 Level of the solar fluid
- 4 Density of the solar fluid

- Fill the standing cylinder at the solar pump unit with 50 ml of solar fluid from the solar system (1).



#### Caution!

**Risk of damage to the thermometer due to excess heat!**

Use the thermometer only for measurements of temperatures up to a maximum of 50 °C.

- Dip the thermometer (3 in Fig. 3.1) into the solar fluid.
- Wait until a temperature of 20 °C has been set.

**Caution!****Risk of damage to the areometer!**

**The areometer is of glass and very fragile. Look after it carefully and pack it in the original packaging immediately after use.**

- Now take the areometer (**2**) out of the protective case and dip it in the solar fluid. The areometer must float freely.
- View the density of the solar fluid (**4**) on the scale of the areometer at the height of the fluid level (**3**).
- Compare the density with Table 4.1 to determine the frost protection of the solar fluid.

You must replace the solar fluid if the frost protection is insufficient.

Filling (% by vol.)	Density at 20 °C (g/cm <sup>3</sup> )	Frost protection (°C)
100	1.034	- 28
Impermissible dilution:		
95	1.032	- 25
90	1.030	- 23
85	1.028	- 20
80	1.026	- 16

**Table 4.1 Density and frost protection of the Vaillant solar fluid**

#### 4.2 Checking the corrosion protection of the solar fluid

- Take the pH indicator rods out of the packaging (**4**) and close it immediately.
- Dip the pH indicator rod briefly into the solar fluid in the standing cylinder.
- Compare the discolouration immediately with the colour table on the packaging of the pH indicator rods.
- Drain the standing cylinder in the catchment tank of the expansion relief valve of the solar pump unit.
- Place the standing cylinder, areometer and thermometer in the transport case after cleaning them with water and drying them.

You must replace the solar fluid if the pH value is below 7.0.

You must also replace the solar fluid if its density is below 1.026 g/cm<sup>3</sup> to ensure sufficient corrosion protection.

## 5 Disposal

The frost protection tester does not belong in the household waste. Make sure the frost protection tester is disposed of properly.

## 6 Vaillant service

To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement. Please contact Vaillant Service Solutions (0870 6060 777) for further details.

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